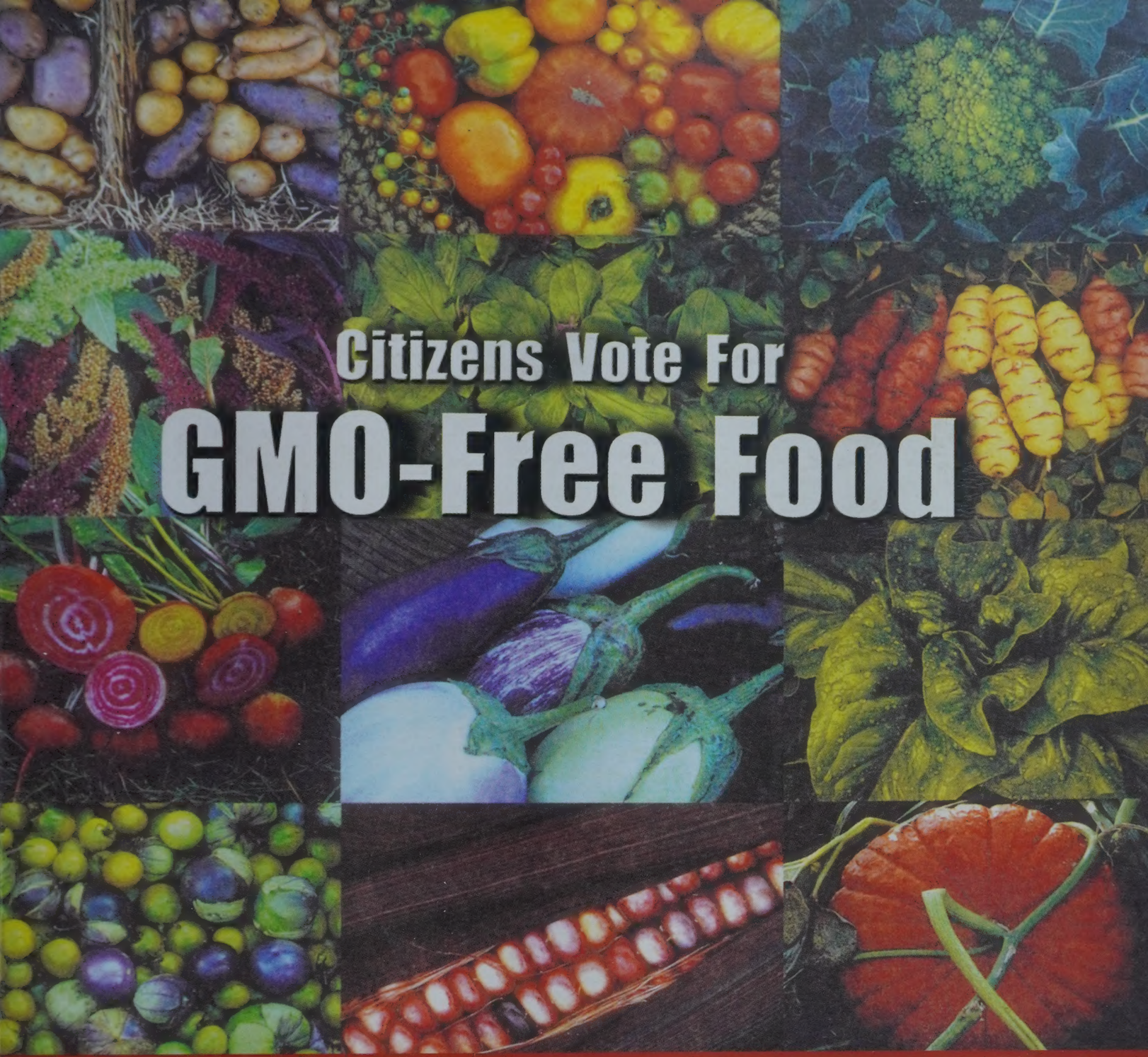

Citizens Vote For GMO-Free Food

Global Citizens' Report on Genetically Modified Crops and Food

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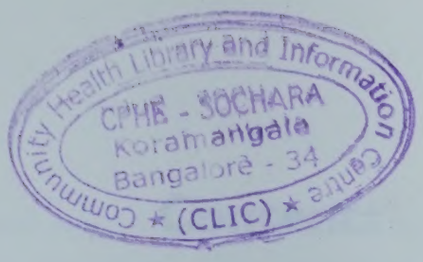

Citizens Vote For GMO-Free Food

Global Citizens' Report on Genetically Modified Crops and Food

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June, 2004

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Contents

Introduction to the Global Citizens' Report on Genetically Modified Crops and Food

Concerned citizens who met at the 7th annual Biodevastation Conference in 2003, decided to launch the campaign **Global Citizens' GMO Challenge** and to put together **Citizens Vote For GMO-Free Food**, a **Global Citizens' Report** on the status of GMOs. This decision was taken after the U.S. announced that it would initiate a dispute against Europe's "GMO moratorium" and submit a complaint at the World Trade Organisation (WTO) regarding the European Community's measures affecting the approval and marketing of biotech products. The Global Citizen's Report on GMOs includes the **Legal Framework on Biosafety and GMOs**. It can serve as a tool of intervention at the WTO – an institution that so far rather defends corporate profits than citizens' food rights.

The Report in hand takes a close look at Genetically Modified (GM) crops and food, from A to Z - from Argentina to Zambia. It shows the status of Genetically Modified Organisms (GMOs) as reported by farmers, scientists, consumers, public interest groups, research organisations, national and international NGOs, and responsible and therefore cautious government agencies.

The Report provides the authentic and diverse picture on the status of GM crops and food in various selected countries as seen by its citizens: the non-acceptance of GM food by the public, the failures of GM crops on the ground and the violation of regulatory structures by the biotech industry.

A few companies such as Monsanto, Syngenta and Bayer CropScience push GM seeds the world over. They try to influence and manipulate governments, ministries and the WTO in order to get the fields cleared for GM crops and push GM food down peoples' throats. The companies claim that GM crops are a means to fight world hunger and to increase the incomes of poor farmers. The companies publish reports in order to "prove" that GM crops and food are safe for the environment and good for people's health – in short, that GMOs harvest nothing but benefits for all.

The Global Citizens' Report refutes the fabricated global reports from the biotech industry. Citizens' groups and independent scientists who took stock of the status of GMOs in their countries have all come to the same conclusions:

- **GMOs do not deliver the benefits promised by the industry. The technology based on a reductionist science has failed.** Despite years of research and aggressive marketing only four countries are growing nearly all of the world's GM crops, with the U.S. alone accounting for nearly two third of it. Global deployment has not taken place, on the contrary products had to be withdrawn. In May 2004, the release of the much-propagated GM RoundupReady wheat by Monsanto was postponed indefinitely. And GM crops, such as Bt cotton in India, often perform poorly - with disastrous economical results for the farmers.

- **Citizens around the world reject GMOs.** Years after the first commercial introduction of GMOs, people do not trust the industry's promises and consider GMOs a threat to biodiversity, to the environment and to their health. Millions of people do not accept GM food. They know that wherever GMOs exist consumers do not really have a choice, because GMO ingredients can be hidden in any food. But citizens around the world are not willing to let the biotech industry; the U.S. or the WTO deny them their right to choose GMO-free food. Therefore,

- **Citizens around the globe fight for the basic democratic right to choose GMO-free food.** They join campaigns to intervene at the WTO (see "The Global Citizens' GMO challenge" p. 77). They put pressure on their governments to ratify and put into practice the only globally relevant instrument to deal with GMOs, the Biosafety Protocol. And they demand a stronger political will to invest in safe and economically viable GMO-free agriculture and food production.

New Delhi, May 2004 *The Editors*

The basics of Genetic Engineering (GE)

GE is a technique within biotechnology. Through GE a gene of one organism (plant, animal, etc.) is transferred into another one. The aim is to reproduce the characteristics of the transferred gene in the receiving organism. Such "newly created" organisms are called Genetically Modified Organisms (GMOs).

Genetic engineering is not simply about taking a naturally occurring gene from one plant and inserting it into another. GE is a complicated process in which artificially constructed genes are transferred. In the laboratory, DNA (Deoxyribonucleic acid, a string which contains all genetic information regarding structure and function of organisms) from a plant cell is extracted and a gene that carries the characteristics to be introduced is isolated. Other required materials are added to it. This artificial construct is than introduced into the cell that is to be engineered. To introduce it a kind of „transport vehicle" that carries the construct from one organism to another is needed.

GE and Traditional Breeding methods have nothing in common

GE is a highly artificial manipulation of genes. GE plants start in the laboratory. GE employs artificial genetic material that is introduced into plant cells. GE disrupts the natural order of genes within the host DNA. GE operates with combinations of genes that would never occur naturally. Traditional breeding (or mating) never introduces genes that are foreign to the species. The only "manipulation" in mating is that "parent genes" are selected. Mating occurs naturally and a natural combination of the hereditary characteristics takes place.

Genetic diversity has been created for generations - but within limits: For example by crossing rice with a different kind of rice, tomato with a different kind of tomato, etc. Through genetic engineering scientists now create plants (or animals) by manipulating genes in a way that does not happen naturally. A plant can be engineered with genes taken from another species, from bacteria, animals, or even humans. If released from the laboratory into the field, GMOs are capable to reproduce and interbreed with natural ones.

The biotech industry argues that plants (and animals) have been selected and manipulated for thousands of years, that GE just goes a step further and does not interfere with people's wellbeing. But GM constructs often contain genetic material of dangerous bacteria or viruses. GE food can contain toxins, allergens as well as antibiotic resistance genes. Genetic material is capable to cross the so-called species barrier. Therefore the possibility exists, that the toxins, allergens and antibiotic resistance of a plant are transferred to people eating GE food.

GMOs – Facts and Fiction

GMOs and Science

Marcello Buiatti*

Many of the partisans of GMOs, particularly in the Plant Biotechnology area, present Genetically Modified Plants (GMPs) as the products of the most advanced science and depict the anti-GMP movement as ideologically driven, antiscientific, incompetent, reactionary. We feel that the time is ripe to discuss this position updating the science behind the present day GMPs in the light of the knowledge gained since their production in the second half of the eighties of last century. This, having clearly in mind two general concepts on which any discussion on the relationships between science and technology should always be based, namely:

- **Science has never yielded absolute truths** but, rather, "local" ones, changing with time and newly obtained data. Particularly, Biology studies are very complex objects (the living systems) where apparently contradictory aspects coexist rendering incorrect extrapolations from local data to universal theories.
- **Technology always follows science progress with a delay of 10 or more years** due to the time needed to convert into marketable products the knowledge gained; it therefore should be continuously in an updating process.

"Modern Biology"

The "modern" Biology birth-date can be placed in the second half of the nineteenth century, when the self defined "medical materialists" in Berlin declared in their "Manifesto" the equivalence of living and non living systems. This concept led to the application to Biology of the so-called "reductionist" method of study, which had already been applied, with great success in physics and chemistry. This method is based on the assumption that natural systems are assemblages if independent parts. The structure of the components is therefore the same when isolated or assembled. All man made machines are good examples of this kind of systems. For instance, a car wheel is exactly the same when part of a car or on sale as such in a Goodyear shop. Following this assumption the reductionist method allows a strong simplification of systems to be studied because components can be analysed one by one and then the fragmented knowledge assembled possibly leading to a mathematical formalised "universal" theory. Gregor Mendel, the physicist founder of modern Genetics in 1864, a former student of the School of Vienna where followers of the new scientific movement were teaching, applied these concepts for the first time to the study of heredity, analysing the behaviour through subsequent generations of plants (peas) chosen as showing alternative forms of a series of characters. For instance Mendel counted how many white and red flower bearing plants were present in the progenies of crosses between the two "pure" lines for those colours. The concepts derived from Mendel's work can be summarised as follows:

- Every living being is endowed with two copies of all heritable "factors" (later on called genes) the two copies bearing both

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the same variant of the characters determined or being "heterozygous" that is having two alternative forms.

- The structure and function of an organism (the "phenotype") is wholly and without any ambiguity determined by its genes.
- Genes and the alternative variants of them are independent from one another, are assorted in a purely probabilistic way in the parents and distributed to the progeny with the only constraint that every individual within one species is endowed with all the same genes although in different variant forms.

Another physicist (Erwin Schrodinger) who inspired many geneticists has completed the mendelian vision in the forties of the 20th century. Schrodinger added to the "mendelian laws" the concept of the existence of a program of the life of every living being and the intuition that there must therefore be also a replicating and transmissible macromolecule long enough to "contain" it. The molecule was later shown to be DNA and its most frequent structure, the double helix, was discovered by Francis Crick, James Watson and others in 1953. The time was ripe for the development of what is still presented by mass media as the basic conceptual frame of whole Biology, the so-called " Central Dogma "of molecular genetics, proposed as such in a famous paper in the journal Nature by Francis Crick himself in 1958. According to the "Dogma" the genes, at that time thought to be the only relevant components of our heritable complement (the "genome"), are strings of DNA, that is long series of four types of small molecules ("nucleotides") whose names initials are A,T,G,C. DNA "directs" the synthesis of proteins, long strings themselves, but in this case of twenty kinds of "aminoacids". The proteins are the tools needed for the dynamic self-construction of all living beings and the order of the amino acids in the string, which determines their function, strictly follows the order of the "letters" in the corresponding DNA. The process leading to protein synthesis is as follows: The series of nucleotides of the gene is copied (transcribed) without mistakes into a parallel string of a molecule very similar to DNA, the RNA, which is then "translated" into a protein - one aminoacid always corresponding to three given nucleotides. Thus, a gene allows the production of only one kind of RNA and of only one protein with one and only one specific function for the character it is determining. According to the Dogma this process is devoid of mistakes, ambiguities and unpredictable features. For this reason, as underlined by Schrodinger, if we become able to "read" the egg we may wholly predict the hen and her life history.

GMOs and the central Dogma of Molecular Biology

The central Dogma and its conceptual consequences have been considered for a long time the only possible "paradigma" of Biology. And they are the theoretical background of Genetic Engineering, the branch of Biotechnology, which led to the production of GMOs. The name, in this case as in many others, has a wanted and relevant meaning. Engineers deal with engines (machines), genetic engineers with the "software" of genetic machines - that is the living beings wholly determined by the DNA, the "fundamental invariant" as called by Jacques Monod in his book "The chance and the necessity". A programme given by a set of assembled and independent genes, carrying the information for the equally independent proteins, is the basis for the construction of the machine itself - exactly like a human project is necessary for the production of a non-living machine. The genetic programme, therefore, once we know gene functions, can be changed at will by humans by simply changing the set of genes for the organism to be "developed", without any danger of unpredictable problems. Although the first "genetic engineers" themselves warned the World at Asilomar in 1974 of the possible dangers deriving from unpredictable effects of gene insertion, this conception has become something very near to an ideology. And it is still largely prevalent in

the biotechnological community, in the mass media and even in the schools of different levels.

However, if we look in an unbiased way to the real products of genetic engineering we can easily see that from the pure production point of view it failed in the animal and plant fields – although it has obtained some success in the development of useful pharmaceutical bacterial products and, unfortunately, of potential deadly bacterial weapons. At present, in 2004, no single genetically modified animal for food production has had any success in the market although the first transgenic mice have been obtained in 1982. In the case of plants, practically all transgenic lines now grown in the fields have been changed through genetic engineering only for two characters, namely resistance to insects and to herbicides. Bt and RoundupReady plants have been produced in 1986. They required a series of further improvements and were released into the market in 1996. Since then, although more cultivars with the same features have been released, no new product, with other useful characters has been developed with success .The species so far transformed with success are essentially maize, soybeans, cotton, canola, and cultivation is widespread only in USA, Canada, Argentina, China. No real breakthrough is envisaged in the near future. The highly advertised "Golden Rice" is not yet on the market and pharmaceutical-producing plants, even if released in the future, will have to be cultivated under confined conditions and on very small areas due to the dangers connected with the possible flow of transgenic pollen to plants for food usage. This branch of possibly useful GMPs will therefore be of no use for agriculture.

Plant and animal genetic engineering has developed only two products in more than twenty years – despite the research work of hundreds of thousands of highly skilled technologists and huge financial investments. It can, therefore, be considered the worst failure of the whole history of innovation in agriculture.

The explanation for such a failure lies in the obsolescence of present day genetic engineering still being based on a twenty year old scientific knowledge of nature and the dynamics of living systems - and being supported only for the persistence of ideological and economic pressures determined by the structure of the world food markets.

The contemporary biology revolution

It is worth noting that the change in the biological conception of life is largely due to great resolution power of the same reductionist method - leading to the development of the central dogma and to the construction of extremely powerful tools and equipments allowing the fast analysis of an unprecedented number of biological molecules and processes. It is the astonishing progress of methods, which has allowed the falsification of the simplistic view of life proposed already in the fifties of last century and the discovery of some of the basic differences between living and non living systems. It has been possible, particularly, to decipher an increasing number of bacterial, animal, plant genomes, to understand the dynamics of the passage from genetic information to proteins, the versatility, redundancy, plasticity of life, to begin the study and the modelling of living networks. We know now that: genes cover only a small portion of plant and animal genomes. The remaining DNA has important regulatory functions of gene activity dynamics:

a) Regulation of gene action allows the expression of different sets of genes at different times, in different parts of the organisms and at different quantitative levels.

b) Genes are activated and their expression is modulated by signals coming from the organisms themselves and from the environments. Therefore life cycle dynamics is not wholly determined by a pre-existing program but founded on a great plasticity of response to environmental changes essential for adaptation. Plasticity is

allowed by a series of processes developed throughout evolution, leading to ambiguity of genome expression in the sense of capacity to activate many functions in response to adaptation needs, with a relatively limited set of tools (genes and proteins).

c) Genes are ambiguous in the sense that single sequences can be translated in more than one protein. In humans, for instance, only three genes carry the information for the production of more than two thousand proteins called neurexins, whose variability is needed for a high level of versatility of our brain. The choice of the specific protein to be produced, the timing of its production, the organ where it is synthesised, the amounts and levels of activity depend in this case, as in the early ones, upon signals coming from the organism and from the environment.

d) Single proteins may perform different functions according to the conformation they assume in the different physico-chemical contexts. Examples of this are the protein leading in one its possible conformations to the BSE syndrome or calmodulin - an ubiquitous protein performing more that twenty different functions without any change in the order of aminoacids of his sequence.

e) Proteins mediate the transformation of one substance into another, and then into another and so, and act in highly connected networks (the metabolic networks or "metabolomes" as they are called nowadays). Metabolic networks, as recently discovered, are modular: Modules being loosely connected with each other and highly connected inside; interactions between proteins and therefore genes, being finely tuned, although maintaining a good level of plasticity. All metabolic networks are endowed with a high level of redundancy allowed by the presence of more copies of the same tools and have developed alternative pathways for the production of the same metabolites. Tools and processes of these two kinds - allowing maintaining the functions relevant for life - have increased in number and efficiency. Throughout evolution and with them has increased the capacity to overcome the effects of damages to single parts of the system and thereby the "robustness" of the living beings. Robustness - that is the capacity to maintain the dynamic equilibrium in spite of destructive noise coming from the environment or due to inner damages - is very high in living systems provided that a sufficient variability and plasticity are maintained and connections within the network are not disrupted. In general such systems respond very well to random noise but have problems when highly connected "knots" are being hit.

f) Life survives if it keeps being variable and plastic, if it is capable to respond to external and internal signals using DNA, protein ambiguity and the many processes fixed throughout evolution for the modulation and alternative usage of the potential tools. It could be said that the right equilibrium between "benevolent" disorder (the variability) and order (the finely tuned connections) is the basis for the persistence of life at all levels of organisation, from cells to ecosystems to the biosphere.

GMOs and Living Systems

Genetic engineering - at variance with what happens in natural crosses between inter-fertile individuals belonging to the same or very similar species where variants (alleles) of the same genes are exchanged - aims at the introduction in animals and plants of genes coming from non inter-fertile organisms, containing the information for proteins and therefore functions not present before in the receiving networks. That means introducing drastic changes in parts of the metabolic network, which will necessary have a high or low disrupting effect in its dynamics of parts of the

system. The level of the change obtained will be directly correlated with the number of connections of the altered knot. Moreover, the inserted gene is generally introduced neither with a regulatory sequence that in most cases allows its continuous expression and does respond neither to internal nor to external signals. This is the primary and obvious reason for the fact that GMOs are the first to suffer from the introduction of an alien gene in their network, which has been co-evolving for very long times thus acquiring the previously mentioned fine tuning. Animals are known to be much more fragile in this sense, not being able to cope with abrupt changes in their genotypes as also shown by the failure to create new breeds through artificial increase of mutation frequencies, a strategy which has been quite useful in crop plants. The unpredictable effects of the manipulation of the genetic network are also the reason for the low productivity of the thousands of GMOs, also with potentially interesting features, which never left the laboratories or the experimental fields because of their low productivity or other unpredicted problems. The two GMPs on the market are healthy and productive plants for the simple reason that the genes integrated in their genomes do not interfere with the internal network, simply producing the wanted proteins. It should also be noted that in the case of Bt a time consuming modification of the introduced bacterial sequence has been necessary to adapt it to the genetic machinery of the plant. The low level of prediction of the effects of genetic engineering is the main cause of all these problems and also of the potential risks for health and environment. Unpredictability stems from the low knowledge of the dynamics of living systems but also from the fact that changes in the environment and partially also within the organism (for instance mutations), leading to reactive changes in the living system, are unpredictable. All genetic engineers know very well that, when they transform hundred plants, the primary products are different one from another. They cannot predict how many copies of the transgene have been inserted in the different plants, where in the genome they have been integrated, if the DNA fragment remained intact or was re-arranged, if DNA expression has been inhibited by the host or not, how the gene product is interacting with the metabolic network, how the GMP is interacting with the environment, and which will be the economic and social consequences of the eventual release of the GMP in the market. A part of these doubts can be clarified with molecular and chemical analyses and more homogeneous plants can be selected with more favourable characters but – with the present day knowledge - other questions may remain unanswered.

Conclusion

Far from being the new science, which will solve all the problems of humanity in a short time, present day genetic engineering is based on obsolete knowledge and an equally obsolete and wrong conception of life.

Present day GMPs are only two very naïve and rough products transformed into symbols of progress by the ideology of homogenisation according to which living beings including humans are equivalent to programme dependent machines and therefore can be changed at will and optimised through software modification. This ideology considers progress as a tendency to an absolute "best" developed by humans. It brings back dark memories of eugenics and the destruction of communities, cultures and diversities of all kinds. Contemporary biology has shown that the best is a loser and that victory in adaptation and survival goes to the more plastic, variable, which are capable to answer different environments in different moments and to repair, through continuous changes, the damages of time. So homogenisation of genotypes, organisms, populations, ecosystems, the biosphere - and at the human level individuals, communities, ethnical entities, cultures - may only lead to a decrease in the adaptation capacity of all living systems. And it leads to the loss of "invention" - both from a physical and cultural point of view - the main winning tool, we, the living beings have for survival.

GMOs – What values?

- For 2003, the biotech industry announces an approximate market value of US$ 4,5 billion for GM crops. But countries growing GMOs face increasing problems selling their ware:
  - **Over the last years Canada has lost all of its oilseed rape (canola) market - worth an estimated 300 million dollars - to Europe.**
  - **Maize export from the U.S. to Europe has declined from 3,3 million tonnes in 1995 to just 25 000 tonnes in 2002 due to fear of GMOs.**
  - **India, Angola, Zambia and others refused to let Food Aid containing GMO ingredients into their countries.**
  - **A survey carried out by Friends of the Earth Europe shows that 94.6 % of EU citizens want to have the right to choose their food, while 70.9 % simply do not want GM food.**
- In 2003 the biotech industry lists 16 countries that commercially grow GMOs - giving the idea that an increasing amount of countries say yes to GMOs.
  In fact three countries, led by the US, grow 90% of all GM crops, another 13 countries grow the remaining 10% and all the other countries of the world do not commercially grow GM crops at all!
- The biotech industry has invested years of expensive research and much propaganda in GMOs.
  In spite of these efforts in 2004 only four GMO crops - soybean, maize, cotton and canola - are commercially grown.
- Monsanto has made a seven-year effort to engineer a RoundupReady hard red spring wheat.
  On 10th May 2004, Monsanto halted its GMO wheat research due to anticipated low demand for this product. The announced GMO wheat has drawn protests from citizens group the world over. The idea that the daily bread of millions could soon be made from GMOs was such a highly rejected idea that further development of this wheat became financially unattractive for Monsanto. (Only two days later Monsanto announced that – for economical reasons - it would not proceed with its GM canola in Australia.)

Commercially grown GM crops 2003

	Country	Hectares	GM crop	Global total %
1.	USA	42.8 million	Canola, Cotton, Maize, Soybean	63
2.	Argentina	13.9 million	Cotton, Maize, Soybean	21
3.	Canada	4.4 million	Canola, Maize, Soybean	6
4.	Brazil	3.0 million	Soybean	4
5.	China	2.8 million	Cotton	4
6.	South Africa	0.4 million	Cotton, Maize, Soybean	1

The above six countries are responsible for 99% of the global biotech crop area.

Australia	0.1 million	Cotton
India	0.1 million	Cotton

Romania (soybean), Uruguay (Maize, Soybean), Spain (Maize), Mexico (Cotton, Soybean)

Philippines (Maize), Colombia (Cotton), Bulgaria (Maize), Honduras (Maize), Indonesia (cotton) grew 0.05 million hectares or less of GMOs.

Principal GM crops 2003:

Soybean	41.4 million hectares	=	55% of total 76 million hectares soybean
Maize	15.5 million hectares	=	11% of 140 million hectares of maize
Cotton	7.2 million hectares	=	21% of the 34 million hectares of cotton
Canola	3.6 million hectares	=	16% planted to a GM variety

Crop value

In 2003, the market value of GM crops was approximately US$ 4,5 - 4.75 billion. The market value of the global transgenic crop market is based on the sale price of transgenic seed plus any technology fees that are applied.

Source: Biotech Bulletin 5/2004/Agrifood Awareness Australia Ltd based on data by the International Service for the Acquisition of Agri-biotech Applications ISAAA

Examples of field trials 2003

Bolivia	:	Potato, soybean
Bulgaria	:	Alfalfa, tobacco
Egypt	:	Cucumber, maize, melon, potato, squash, sugar cane, tomato, wheat, cantaloupe
India	:	Bell pepper, brinjal, cabbage, cauliflower, chilli, cotton, mustard/rape seed, potato, rice, tobacco, tomato
Mexico	:	cotton, potato, tomato, maize, soybean, sugar beet
South Africa	:	Canola, cotton, eucalyptus, lucerne, maize, potato, soybean, strawberry, sugarcane
Thailand	:	Cotton, tomato
Russian Federation	:	Maize, potato, soybean, sugar beet
The Philippines	:	Maize
Ukraine	:	Canola, maize, potato, sugar beet

Source: Agricultural Biotechnology, www.agriculture.purdue.edu/agbiotech

Types of GM crops

The main GM crops are either **herbicide or insect resistant crops**. On a smaller scale, **virus resistant crops** are developed.

Herbicide resistant crops:

The most important ones are Monsanto's RoundupReady varieties of soya, maize, oilseeds, as well as wheat and vegetables that are resistant to Monsanto's herbicide Roundup. Further herbicide resistant crops include cotton, flax, rice, and beet.

Insect resistant crops:

The most widespread ones are Bt Corn and Bt cotton.
Further insect resistant crops include potato and tomato.

Virus resistant crops:

Papaya, potato, squash, watermelon and zucchini

RoundupReady are genetically engineered varieties of maize, soya, wheat, vegetables, and oilseeds that are not affected by the use of the Roundup herbicide.

Roundup is a broad-based herbicide. It contains glyphosate and surfacant. When Roundup is sprayed the surfacant prevents the liquid herbicide from forming into drops that would fall off the surface of the plant. This helps the Roundup to penetrate the plant cells. When Roundup is sprayed, all other plants or "weeds" except the RoundupReady crop dies. Roundup does not distinguish between weeds and desirable vegetation, and thus also kills plants, which serve as food, fodder or medicine.

Bollgard (Bt) Cotton is genetically engineered cotton. It contains genes taken from a soil bacterium (Bacillus thuringiensis). Bt cotton has promoters that create high does of toxins, which are released in all parts of a plant during the entire life span of the crop.The principal aim of these toxins is to control bollworm or budworm, widespread cotton pests. However, farmers in various countries had to use pesticide on Bt cotton despite Monsanto's propaganda that using Bt crops means an end to the pesticide era.

GM seeds and crops companies

Monsanto

Monsanto is the biggest seller of GM seeds worldwide. In 2003, about 90% of all area planted with GE crops worldwide were planted with Monsanto seeds. Major income comes from sales of Roundup herbicide and soybean, corn, canola and cotton RoundupReady (RR) seeds. Since Roundup herbicide has gone off patent Monsanto pushes RR key crops, which are resistant to Roundup herbicide.

Headquarters: 800 North Lindbergh Blvd., St. Louis, Missouri 63167, United States. Global offices and plants located in: Argentina; Australia; Austria; Belgium; Brazil; Bulgaria; Canada; Chile; China; Colombia; Costa Rica; Croatia; Czech Republic; Denmark; France; Germany; Greece; Guatemala; Hong Kong; Hungary; India; Indonesia; Italy; Japan; Kenya; Korea; Malawi; Malaysia; Mexico; Pakistan; Philippines; Poland; Portugal; Puerto Rico; Romania; Russian Federation; Senegal; Singapore; Slovakia; South Africa; Spain; Taiwan; Tanzania; Thailand; Turkey; Ukraine; United Kingdom; United States; Venezuela; Vietnam; Zimbabwe.

Monsanto Subsidiaries

(Does not include those carrying the Monsanto name)

Agracetus (Middleton, Wisconsin), acquired in 1996. Functional food products and plantibodies.

Asgrow (Des Moines, Iowa), acquired in 1997. Seed production and marketing company.

Calgene (Davis, California), acquired in 1997. GE seeds for produce, cotton and oils.

Cargill Seeds, acquired in 1998 for $1.4 billion. Operations in Asia, Africa, Central and South America and Europe (excluding UK).

Corn States Hybrid Service (Des Moines, Iowa), acquired in 1997 for $1 billion.

DEKALB genetics (DeKalb, Illinois), acquired in 1998 for $2.3 billion. Has 11% of US corn seed market (2nd only to Pioneer Hi-Bred). Independently markets Monsanto technology.

First Line Seed (Guelph, Canada), acquired in 1998. Producer/distributor of RR soybean varieties.

Holden's Foundation Seeds Inc., acquired in 1997 for US$1 billion. Develops, grows and supplies corn germplasm. Major supplier of parent seed to retail seed companies. (Acquisition included Corn States Hybrid Service, Inc. and Corn States International).

Limagrain Canada Seeds (Saskatoon, Saskatchewan), acquired in 2001. Major canola seed research, production and marketing company.

Maharasta Hybrid Seed Co. (Mahyco) (Dawalwadi, Jalna), acquired in 1998. India's largest private seed company. Monsanto India owns 26%. There is a joint venture between Monsanto and Mahyco (50/50) called Mahyco Monsanto Biotech (MMB). Has commercially launched Bollgard cotton in India.

Monsoy, acquired by Monsanto in 1996. Largest soybean supplier in Brazil.

PT Monagro Kimia, (Jakarta) Indonesia, subsidiary of Monsanto.

Sementes Agroceres (Sao Paulo), acquired in 1997. Has 30% share of Brazilian corn seed market.

Source: Monsanto – The GeneGiant, RFSTE/Navdanya/Polaris Institute, 2004

Monsanto Products

Product	Countries where commercially grown (year first commercially grown) and/or received planting, food and feed approval	Other details
Roundup Ready (RR) soybeans (Resistant to Roundup herbicide)	Argentina (1996); U.S (1996); Canada (1998); Romania (1999); Mexico (2000); Uruguay (2001); South Africa (2001)	Field trials and planting of smuggled seed in Brazil. Field trials have occurred in Bolivia and Indonesia. Grown for seed in Paraguay.
RR canola	Canada (1996); U.S.(1999)	Will likely be commercially grown in Australia in 2003/04.
RR cotton	U.S. (1997); Australia (2000); Argentina (2001); South Africa (2000)	Being developed for Brazil and Turkey.
RR corn	U.S. (1998); Bulgaria (1999); Canada (1999)	Pushing for approval in Argentina. Has been approved for 'cultivation and use' in South Africa. Field trials planned for India and have been conducted in Indonesia.
Bollgard cotton (Protection from budworm and bollworms)	Australia (1996); Mexico (1996); U.S. (1996); Argentina (1998); China (in several provinces) (1998); India (2002); Indonesia (2001); South Africa (1998)	Field trials are occurring in Burkina Faso
Bollgard II cotton (Second generation Bollgard cotton)	U.S. (2003); Australia (since 2003 in New South Wales and southern Queensland)	Pushing for approval in Argentina, Mexico and South Africa
YieldGard corn (Protection from corn borers and corn earworms)	U.S. (1997); Canada (1997); South Africa (1999); Argentina; Germany (2000); Philippines (2002); Honduras; Spain	Pushing for approval in Brazil, Bulgaria, the Honduras, Venezuela, Mexico, Hungary and Indonesia.
YieldGard Rootworm corn (Specifically targetscorn rootworm larvae).	Canada (2003)[1] Limited supplies available for the 2003 season; U.S.	
Bollgard/RR cotton	Australia; Mexico; U.S. (1997); South Africa (2002 approved)	
Bollgard II/RR cotton		Has been approved by regulatory authorities in the U.S. Monsanto has applied to plant in South Africa at two sites for production for U.S. seed supplies.
YieldGard/ RR corn	U.S. (2000)	
YieldGard Rootworm/ RR corn	U.S. (2003)	
Posilac	U.S	GE growth hormone for increased dairy production in cattle. Extremely controversial product, which was not approved in Canada despite aggressive tactics by Monsanto.

DuPont

Headquarters Delaware, USA, bought **Pioneer H-Bred** in 1998. DuPont entered into a technology sharing agreement with Monsanto in 2002 and markets GM crops through Pioneer, including many containing licensed GM crop traits from Monsanto and Bayer/Aventis.

Syngenta

Headquarters Basel, Switzerland, internationally active.
Drug giants **Novartis** and **AstraZeneca** spun off their respective agrochemical and seed businesses in 2000, creating Syngenta. Syngenta is the biggest producer of agricultural chemicals and ranks third in the commercial seeds market.

Products are crop protection products (insecticides, herbicides, fungicides), field crop seeds, vegetable seeds, and flowers. Zeneca's slow ripening tomato was the first GM food product to be marketed in Europe in spring 1996 (this line has since been discontinued). According to the company, in 2003 gene-altered crops accounted for 3% of Syngenta's sales.

GMO products include: Varieties of GM Bt insect resistant corn such as NKYieldgard and NKKnockout (also called Event 176, the only GM crop approved for commercial growing in the EU) as well as herbicide tolerant seeds.

Infamous StarLink – Feed or Food?

In autumn 2000 traces of Aventis CropScience's Bt insect resistant maize known as 'StarLink' (Cry9C), which had been grown in the U.S. but only had clearance for use as an animal feed, began to be discovered in the human food supply chain. Despite accounting for less than 1% of the total area of maize grown in the U.S. in 2000, traces of StarLink contamination were found in upwards of 10% of all maize grown in the US for that year. The incident has led to millions of dollars worth of product recalls and is said to have cost Aventis over $1bn. Liability for StarLink contamination has remained with Aventis rather than with Bayer CropScience.

Source: www.corporatewatch.org.uk/genetics/commercialisation/bayer.htm

Bayer CropScience

Headquarters Leverkusen, Germany.
Bayer CropScience (BCS) was formed in 2002 when Bayer aquired Aventis CropScience from Aventis and Schering. Bayer is globally active with offices in North and South America, in Africa, Asia and the Pacific Region.

Main GM crop sales are in the U.S. and Canada. BCS tries hard to establish its crops in other countries such as Australia, the UK, Europe. In India, Bayer, through its subsidiary **Pro Agro,** pushes SeedLink GM mustard for commercial growth.

GM products include LibertyLink maize and oilseed rape, LibertyLink/SeedLink oilseed rape, herbicide tolerant oilseed rape Navigator.

Sources: company information; www.genewatch.org; Publications RFSTE/Polaris Institute

Patents

A means to try to ensure control over agriculture and markets are patents:

What is a patent?

If somebody invents a machine, a tool, etc. she or he can apply for a patent at her/his government's patent office. If such a patent is issued, it guarantees the inventor the exclusive right to use, to manufacture and to sell her/his invention for a fixed period of time. Monsanto, Syngenta, Bayer CropScience, etc. have genetically engineered plants, seeds and even individual genes patented.

Intellectual Property Rights

Over the last years industrialised countries have increasingly granted patents for existing plants as well as genetically engineered plants and their seeds to the GE industry. These give companies the right to use such plants as a private property - and they consider themselves as the legitimate owners. Corporations now claim „intellectual property rights" which means they can withhold patented plants/seeds from farmers. According to corporate thinking, farmers worldwide are not allowed to replant or exchange patented seeds, even though seed exchange is something they have done for generations. If farmers want to use patented seeds they have to pay the corporations for it. If they don't pay but still grow such seeds - on purpose or because their crops have been „infiltrated" accidentally by an engineered organism – they can be accused and fined.

Corporate fight

The U.S. Patent and Trademark Office issued to Syngenta another patent covering a gene resistant to insects, the fifth in a series covering synthetic Bt genes that provide resistance to the European corn borer and the corn rootworm. Three of the previously issued patents are the subject of a lawsuit Syngenta filed on July 25, 2002 in the Federal District Court in Wilmington, DE. The lawsuit charges that Monsanto, DeKalb Genetics, Pioneer Hi-Bred, DowAgroSciences and Mycogen Seeds are infringing one or more of these patents with their YieldGard and Herculex product lines. The lawsuit is expected to go to trial in November 2004.

CropChoice News, 15 April, 2004

GMO Food

Where GMOs hide

GM ingredients can be hidden anywhere – from chips to soup to baby food to biscuits to practically anything.

Many food products the world over contain **corn starch** or **soya lecithin** and large quantities of soya and maize are genetically modified.

GM grains are also widely used for **animal feed**. The question lingers in people's mind: Can they enter the human food chain?

And last but not least, hidden in **Food Aid,** GMOs have entered (or nearly entered) many countries.

GMO-free?

As long as GM crops are grown, food cannot be kept GM-free. Being at the origin of the problem, every company in the world producing and selling GM seeds, crops and food should be obliged to clearly state that their product is genetically engineered and what it contains. Since this is not the case, governments have to take responsibilities. Many countries do not allow GM food to be sold. Many countries say they leave the decision to the consumers and have introduced or are about to introduce labelling practices for foodstuff where „GM ingredients" have to be declared. (See also "Legal Framework for Biosafety and GMOs" - GM foods/Rules on traceability and labelling", page 100)

In various countries citizens' organisations have put together "shopping lists" warning people about certain food articles containing GMOs. However, in order to trace GMOs in a product, extensive and expensive tests have to be carried out. Where there is no strict governmental test, label and control system in place - to chase GMOs is a costly and complicated affair for citizens and citizens' groups.

The following is an example of where to watch out (see page 20):

Extract from a "Shopping List"

By Mothers for Natural Law, U.S.

http://mailhost.groundspring.org/cgi-bin/t.pl?id=24885:650917

There are about 40 varieties of genetically engineered crops approved for marketing in the U.S. As a result, 60-70% of the foods on your grocery shelves contain genetically engineered components.If you really want to avoid the influence of genetic engineering, buy fresh organic produce. If you want to buy processed foods and avoid genetically engineered ingredients, you will have to read product labels. If the label mentions any of the ingredients listed below without explicitly qualifying it as organic, then the product probably contains genetically engineered ingredients.

Primary GMO Suspects: Ingredients and Products to Check

Soybeans: Soy flour, soy oil, lecithin, soy protein isolates and concentrates. Products that may contain genetically engineered soy derivatives: vitamin E, tofu dogs, cereals, veggie burgers and sausages, tamari, soy sauce, chips, ice cream, frozen yoghurt, infant formula, sauces, protein powder, margarine, soy cheeses, crackers, breads, cookies, chocolates, candies, fried foods, shampoo, bubble bath, cosmetics, enriched flours and pastas.

Corn: Corn flour, cornstarch, corn oil, corn sweeteners, syrups. Products that may contain genetically engineered corn derivatives: vitamin C, tofu dogs, chips, candies, ice cream, infant formula, salad dressings, tomato sauces, breads, cookies, cereals, baking powder, alcohol, vanilla, margarine, soy sauce, tamari, soda, fried foods, powdered sugar, enriched flours and pastas.

Canola: Oil. Products that may contain GE canola derivatives: chips, salad dressings, cookies, margarine, soaps, detergents, soy cheeses, fried foods.

Cotton: Oil, fabric. Products that may contain GE cotton or its derivatives: clothes, linens, chips, peanut butter, crackers, cookies.

Potatoes: Right now the only potato that has been GE is the Burbank Russet, but you still have to look out for potato starch and flour. Products that may contain genetically engineered potatoes or derivatives: unspecified processed or restaurant potato products (fries, mashed, baked, mixes, etc.), chips, Passover products, vegetable pies, soups. Fast-food chains appear to have responded to consumer concerns and requested genetically natural potatoes.

Dairy Products: Milk, cheese, butter, buttermilk, sour cream, yoghurt, whey. You have to ask several questions when you are looking at dairy products. Have the cows been treated with rBGH? What kind of feed have they been given? If they are not being fed organic grains, chances are quite likely that they will be eating genetically engineered animal feed. What does this do to their milk products? No one knows.

Animal Products: Because animal feed often contains genetically engineered organisms, all animal products, or by-products may be affected.

Please note that a food may contain some of these items and yet be free from genetically engineered organisms. There is no way of knowing without tracking down every brand, every product and every ingredient. Even reading labels is no guarantee that you will be able to avoid genetically engineered ingredients, because manufacturers are not required to list every ingredient, enzyme or organism used in the manufacturing process.

GMOs – The Big Threat

Remember the Green Revolution? For years people have been told that the use of chemical pesticides is completely safe. Today we know how pesticides affect our soil, our water, and our health. Now we are told that genetic engineering only brings benefit, no harm – even though studies and growing public anxiety point to the contrary. Do we have to let GM crops and food play havoc with the environment and our health for years until it is "proven" that they are not as safe as we've been told?

If there's a will, there's a way to ban harmful pesticides. But nobody can ban or control GMOs once they are out. They are here to stay –irreversibly. For the better or worse – and the worst might be like a science fiction movie or a bad dream. But you can neither walk out on it nor wake up and find things are as they were before.

No GM food and crops, Handbook for Activists, Navdanya, India 2003

Too many risks

The agribusiness claims that GMOs solve the problem of world hunger, and that they are safe for the environment and for people. Citizens' groups, farmers, consumers and many scientists the world over doubt GE in agriculture because there are too many unknown risks:

At a glance: Six reasons to say NO to GMOs

GM crops and food

- **Spread biopollution**
  GM crops can contaminate natural varieties and organic crops
- **Are a health risk**
  GM food can provoke resistance to antibiotics, allergies and new illnesses
- **Destroy biodiversity**
  Herbicides are poisonous for beneficial species and breed new resistant pests
- **Increase hunger**
  Loss of biodiversity means loss of food.
- **Reduce income**
  GM crops require high inputs often not matched by yields.
- **Enslave people**
  Farmers and consumers lose control over agriculture and the right to choose their food.

The case for a GMO-free Sustainable World

By the Independent Science Panel (ISP)*

Why GM-free?

1. GM crops failed to deliver promised benefits

The consistent finding from independent research and on-farm surveys since 1999 is that GM crops have failed to deliver the promised benefits of significantly increasing yields or reducing herbicide and pesticide use. GM crops have cost the United States an estimated $12 billion in farm subsidies, lost sales and product recalls due to transgenic contamination. Massive failures in Bt cotton of up to 100% were reported in India. Biotech corporations have suffered rapid decline since 2000, and investment advisors forecast no future for the agricultural sector. Meanwhile worldwide resistance to GM has reached a climax in 2002 when Zambia refused GM maize in food aid despite the threat of famine.

2. GM crops pose escalating problems on the farm

The instability of transgenic lines has plagued the industry from the beginning, and this may be responsible for a string of major crop failures. A review in 1994 stated, "While there are some examples of plants which show stable expression of a transgene these may prove to be the exceptions to the rule. In an informal survey of over 30 companies involved in the commercialisation of transgenic crop plants almost all of the respondents indicated that they had observed some level of transgene inaction. Many respondents indicated that most cases of transgene inactivation never reach the literature." Triple herbicide-tolerant oilseed rape volunteers that have combined transgenic and non-transgenic traits are now widespread in Canada. Similar multiple herbicide-tolerant volunteers and weeds have emerged in the United States. In the United States, glyphosate-tolerant weeds are plaguing GM cotton and soya fields, and atrazine, one of the most toxic herbicides, has had to be used with glufosinate-tolerant GM maize. Bt biopesticide traits are simultaneously threatening to create superweeds and Bt- resistant pests.

3. Extensive transgenic contamination unavoidable

Extensive transgenic contamination has occurred in maize landraces growing in remote regions in Mexico despite an official moratorium that has been in place since 1998. High levels of contamination have since been found in Canada. In a test of 33

**The Independent Science Panel (ISP) is a panel of scientists from many disciplines and countries, committed to the promotion of science for the public good. The Genetic Modification Group of the ISP consists of scientists working in genetics, biosciences, toxicology and medicine, and other representatives of civil society who are concerned about the harmful consequences of genetic modifications of plants and animals. http://www.indsp.org/gmgroup.php; http://www.indsp.org/ISPreportSummary.php*

certified seed stocks, 32 were found contaminated. New research shows that transgenic pollen, wind-blown and deposited elsewhere, or fallen directly to the ground, is a major source of transgenic contamination. Contamination is generally acknowledged to be unavoidable, hence there can be no co-existence of transgenic and non-transgenic crops.

4. GM crops not safe

Contrary to the claims of proponents, GM crops have not been proven safe. The regulatory framework was fatally flawed from the start. It was based on an anti-precautionary approach designed to expedite product approval at the expense of safety considerations. The principle of 'substantial equivalence', on which risk assessment is based, is intended to be vague and ill-defined, thereby giving companies complete licence in claiming transgenic products 'substantially equivalent' to non-transgenic products, and hence 'safe'.

5. GM food raises serious safety concerns

There have been very few credible studies on GM food safety. Nevertheless, the available findings already give cause for concern. In the still only systematic investigation on GM food ever carried out in the world, 'growth factor-like' effects were found in the stomach and small intestine of young rats that were not fully accounted for by the transgene product, and were hence attributable to the transgenic process or the transgenic construct, and may hence be general to all GM food. There have been at least two other, more limited, studies that also raised serious safety concerns.

6. Dangerous gene products are incorporated into crops

Bt proteins, incorporated into 25% of all transgenic crops worldwide, have been found harmful to a range of non-target insects. Some of them are also potent immunogens and allergens. A team of scientists have cautioned against releasing Bt crops for human use.

Food crops are increasingly used to produce pharmaceuticals and drugs, including cytokines known to suppress the immune system, induce sickness and central nervous system toxicity; interferon alpha, reported to cause dementia, neurotoxicity and mood and cognitive side effects; vaccines; and viral sequences such as the 'spike' protein gene of the pig coronavirus, in the same family as the SARS virus linked to the current epidemic. The glycoprotein gene *gp120* of the AIDS virus HIV-1, incorporated into GM maize as a 'cheap, edible oral vaccine', serves as yet another biological time-bomb, as it can interfere with the immune system and recombine with viruses and bacteria to generate new and unpredictable pathogens.

7. Terminator crops spread male sterility

Crops engineered with 'suicide' genes for male sterility have been promoted as a means of 'containing', i.e., preventing the spread of transgenes. In reality, the hybrid crops sold to farmers spread both male sterile suicide genes as well herbicide tolerance genes via pollen.

8. Broad-spectrum herbicides highly toxic to humans and other species

Glufosinate ammonium and glyphosate are used with the herbicide-tolerant transgenic crops that currently account for 75% of all transgenic crops worldwide. Both are systemic metabolic poisons expected to have a wide range of harmful effects, and these have been confirmed. Glufosinate ammonium is linked to neurological, respiratory, gastrointestinal and haematological toxicities, and birth defects in humans and mammals. It is toxic to butterflies and a number of beneficial insects, also to the larvae of clams and oysters, Daphnia and some freshwater fish, especially the rainbow trout. It inhibits beneficial soil bacteria and fungi, especially those that fix nitrogen. Glyphosate is the most frequent cause of complaints and poisoning in the UK. Disturbances of many body functions have been reported after exposures at normal use levels. Glyphosate exposure nearly doubled the risk of late spontaneous abortion, and children born to users of glyphosate had elevated neurobehavioral defects. Glyphosate caused retarded development of the foetal skeleton in laboratory rats. Glyphosate inhibits the synthesis of steroids, and is genotoxic in mammals, fish and frogs. Field dose exposure of earthworms caused at least 50 percent mortality and significant intestinal damage among surviving worms. Roundup caused cell division dysfunction that may be linked to human cancers. The known effects of both glufosinate and glyphosate are sufficiently serious for all further uses of the herbicides to be halted.

9. Genetic engineering creates super-viruses

By far the most insidious dangers of genetic engineering are inherent to the process itself, which greatly enhances the scope and probability of horizontal gene transfer and recombination, the main route to creating viruses and bacteria that cause disease epidemics. This was highlighted, in 2001, by the 'accidental' creation of a killer mouse virus in the course of an apparently innocent genetic engineering experiment. Newer techniques, such as DNA shuffling are allowing geneticists to create in a matter of minutes in the laboratory millions of recombinant viruses that have never existed in billions of years of evolution. Disease-causing viruses and bacteria and their genetic material are the predominant materials and tools for genetic engineering, as much as for the intentional creation of bio-weapons.

10. Transgenic DNA in food taken up by bacteria in human gut

There is already experimental evidence that transgenic DNA from plants has been taken up by bacteria in the soil and in the gut of human volunteers. Antibiotic resistance marker genes can spread from transgenic food to pathogenic bacteria, making infections very difficult to treat.

11. Transgenic DNA and cancer

Transgenic DNA is known to survive digestion in the gut and to jump into the genome of mammalian cells, raising the possibility for triggering cancer. The possibility cannot be excluded that feeding GM products such as maize to animals also carries risks, not just for the animals but also for human beings consuming the animal products.

12. CaMV 35S promoter increases horizontal gene transfer

Evidence suggests that transgenic constructs with the CaMV 35S promoter might be especially unstable and prone to horizontal gene transfer and recombination, with all

the attendant hazards: gene mutations due to random insertion, cancer, reactivation of dormant viruses and generation of new viruses. This promoter is present in most GM crops being grown commercially today.

13. A history of misrepresentation and suppression of scientific evidence

There has been a history of misrepresentation and suppression of scientific evidence, especially on horizontal gene transfer. Key experiments failed to be performed, or were performed badly and then misrepresented. Many experiments were not followed up, including investigations on whether the CaMV 35S promoter is responsible for the 'growth-factor-like' effects observed in young rats fed GM potatoes.

Conclusion: GM crops have failed to deliver the promised benefits and are posing escalating problems on the farm. Transgenic contamination is now widely acknowledged to be unavoidable, and hence there can be no co-existence of GM and non-GM agriculture. Most important of all, GM crops have not been proven safe. On the contrary, sufficient evidence has emerged to raise serious safety concerns that if ignored could result in irreversible damage to health and the environment. GM crops should be firmly rejected now.

Why Sustainable Agriculture?

1. Higher productivity and yields, especially in the Third World

Some 8.98 million farmers have adopted sustainable agriculture practices on 28.92 million hectares in Asia, Latin America and Africa. Reliable data from 89 projects show higher productivity and yields: 50-100% increase in yield for rainfed crops, and 5-10% for irrigated crops. Top successes include Burkina Faso, which turned a cereal deficit of 644 kg per year to an annual surplus of 153 kg; Ethiopia, where 12 500 households enjoyed 60% increase in crop yields; and Honduras and Guatemala, where 45 000 families increased yields from 400-600 kg/ha to 2 000-2 500 kg/ha.

Long-term studies in industrialised countries show yields for organic comparable to conventional agriculture, and sometimes higher.

2. Better soils

Sustainable agricultural practices tend to reduce soil erosion, as well as improve soil physical structure and water-holding capacity, which are crucial in averting crop failures during periods of drought. Soil fertility is maintained or increased by various sustainable agriculture practices. Studies show that

What's Wrong?
FAO rides the GM bandwagon

The UN Food and Agriculture Organisation in its annual report "The State of Food and Agriculture" released in May 2004 asks: "Agricultural Biotechnology - Meeting the needs of the poor? The answer puts the global public agency on food and agriculture to shame. While mentioning that GM food is not a panacea for global hunger, FAO nevertheless recommends that governments of developing countries invest in agricultural biotechnology research. Such FAO plays right into the hands of the agri-corporate world. Public-private partnerships in agricultural biotech research means that governments subsidise corporations that are determined to control local crops and food. Public money will be spent on Monsanto and other companies instead of being invested in GM-free, low-cost, sustainable and economically viable agriculture.

soil organic matter and nitrogen levels are higher in organic than in conventional fields. Biological activity has also been found to be higher in organic soils. There are more earthworms, arthropods, mycorrhizal and other fungi, and micro-organisms, all of which are beneficial for nutrient recycling and suppression of disease.

3. Cleaner environment

There is little or no polluting chemical-input with sustainable agriculture. Moreover, research suggests that less nitrate and phosphorus are leached to groundwater from organic soils.

Better water infiltration rates are found in organic systems. Therefore, they are less prone to erosion and less likely to contribute to water pollution from surface runoff.

4. Reduced pesticides and no increase in pests

Organic farming prohibits routine pesticide application. Integrated pest management has cut the number of pesticide sprays in Vietnam from 3.4 to one per season, in Sri Lanka from 2.9 to 0.5 per season, and in Indonesia from 2.9 to 1.1 per season. Research showed no increase in crop losses due to pest damage, despite the withdrawal of synthetic insecticides in Californian tomato production. Pest control is achievable without pesticides, reversing crop losses, as for example, by using 'trap crops' to attract stem borer, a major pest in East Africa. Other benefits of avoiding pesticides arise from utilising the complex inter-relationships between species in an ecosystem.

5. Supporting biodiversity and using diversity

Sustainable agriculture promotes agricultural biodiversity, which is crucial for food security and rural livelihoods. Organic farming can also support much greater biodiversity, benefiting species that have significantly declined. Biodiverse systems are more productive than monocultures. Integrated farming systems in Cuba are 1.45 to 2.82 times more productive than monocultures. Thousands of Chinese rice farmers have doubled yields and nearly eliminated the most devastating disease simply by mixed planting of two varieties. Soil biodiversity is enhanced by organic practices, bringing beneficial effects such as recovery and rehabilitation of degraded soils, improved soil structure and water infiltration.

6. Environmentally and economically sustainable

Research on apple production systems ranked the organic system first in environmental and economic sustainability, the integrated system second and the conventional system last. Organic apples were most profitable due to price premiums, quicker investment return and fast recovery of costs. A Europe-wide study showed that organic farming performs better than conventional farming in the majority of environmental indicators. A review by the Food and Agriculture Organisation of the United Nations (FAO) concluded that well-managed organic agriculture leads to more favourable conditions at all environmental levels.

7. Ameliorating climate change by reducing direct & indirect energy use

Organic agriculture uses energy much more efficiently and greatly reduces CO_2 emissions compared with conventional agriculture, both with respect to direct energy consumption in fuel and oil and indirect consumption in synthetic fertilisers and

pesticides. Sustainable agriculture restores soil organic matter content, increasing carbon sequestration below ground, thereby recovering an important carbon sink. Organic systems have shown significant ability to absorb and retain carbon, raising the possibility that sustainable agriculture practices can help reduce the impact of global warming. Organic agriculture is likely to emit less nitrous dioxide (N_2O), another important greenhouse gas and also a cause of stratospheric ozone depletion.

8. Efficient, profitable production

Any yield reduction in organic agriculture is more than offset by ecological and efficiency gains. Research has shown that the organic approach can be commercially viable in the long-term, producing more food per unit of energy or resources. Data show that smaller farms produce far more per unit area than the larger farms characteristic of conventional farming. Though the yield per unit area of one crop may be lower on a small farm than on a large monoculture, the total output per unit area, often composed of more than a dozen crops and various animal products, can be far higher. Production costs for organic farming are often lower than for conventional farming, bringing equivalent or higher net returns even without organic price premiums. When price premiums are factored in, organic systems are almost always more profitable.

9. Improved food security and benefits to local communities

A review of sustainable agriculture projects in developing countries showed that average food production per household increased by 1.71 tonnes per year (up 73%) for 4.42 million farmers on 3.58 million hectares, bringing food security and health benefits to local communities. Increasing agricultural productivity has been shown to also increase food supplies and raise incomes, thereby reducing poverty, increasing access to food, reducing malnutrition and improving health and livelihoods. Sustainable agricultural approaches draw extensively on traditional and indigenous knowledge, and place emphasis on the farmers' experience and innovation. This thereby utilises appropriate, low-cost and readily available local resources as well as improves farmers' status and autonomy, enhancing social and cultural relations within local communities. Local means of sale and distribution can generate more money for the local economy. (Example: For every £1 spent at an organic box scheme from Cusgarne Organics (UK), £2.59 is generated for the local economy; but for every £1 spent at a supermarket, only £1.40 is generated for the local economy.)

10. Better food quality for health

Organic food is safer, as organic farming prohibits routine pesticide and herbicide use, so harmful chemical residues are rarely found. Organic production also bans the use of artificial food additives such as hydrogenated fats, phosphoric acid, aspartame and monosodium glutamate, which have been linked to health problems as diverse as heart disease, osteoporosis, migraines and hyperactivity. Studies have shown that, on average, organic food has higher vitamin C, higher mineral levels and higher plant phenolics – plant compounds that can fight cancer and heart disease, and combat age-related neurological dysfunctions – and significantly less nitrates, a toxic compound.

Conclusion: Sustainable agricultural practices have proven beneficial in all aspects relevant to health and the environment. In addition, they bring food security and social and cultural well being to local communities everywhere. There is an urgent need for a comprehensive global shift to all forms of sustainable agriculture.

GMOs Around the World

Africa

Only South Africa grows GM crops commercially. The biotech industry, however, tries to push its way into African soil. And the "surplus" GM Food produced by the same industry - surplus because hardly any country wants to buy GM food anymore - is scandalously pushed on African countries in the name of Food Aid.

South Africa

South Africa is the only African country that has adopted GM crops for commercial production. Besides GM cotton, genetically altered maize, soya and some oilseed rape are grown. GMO field trials or releases are regulated under the National Environmental Management Act. South Africa has signed the Biosafety Protocol but according to its citizens it is not implemented the way it should be. The following highlights the GMO situation in South Africa:

Monsanto's influence in South Africa

South Africa is producing RoundupReady soybeans, Bollgard cotton and YieldGard corn commercially. The country's National Strategy on Biotechnology, created in 2001, was based on consultations with Monsanto (as well as large commercial farmers' associations and other biotech corporations, including Syngenta). It is reported that Monsanto and the Department of Agriculture have been handing out free GE seeds to small-scale farmers. Monsanto has also provided money, land and infrastructure to train black farmers. This has occurred amidst limited resources towards strengthening the black commercial farming sector by the country's government. In 2000, Monsanto converted its research station in Delmas Mpumalanga into the Buhle Academy and agreed to fund Buhle for its first three years of operation (from 2000 - 2003). Monsanto says that Buhle contributes to social and economic improvements of local agricultural communities. But prospective students at Buhle are required to show they have access to land before they can gain entry into the Academy, meaning that admittance is limited since the majority of farmland in South Africa is owned by white farmers. And while 120 farmers have been trained at the Academy there is no evidence that this has led to any useful results.

The Makhathini Flats: Why farmers grow Bt cotton

Perhaps the most significant presence of Monsanto's GE seeds is the Makhathini Flats, in the country's northeastern corner, where 95% of the 4,000 smallholder farmers are growing Bt cotton. Why such a massive adoption? Vunisa Cotton has an agribusiness monopoly in Makhathini. It is a private, commercial supplier of seed, fertiliser,

pesticide, credit and information to smallholder farmers in the region, as well as a buyer of cotton harvest. Vunisa heavily promotes and sells Bt cottonseed. (The seed is supplied by Delta & Pineland, and was developed using a Bt gene owned by Monsanto). Many poor farmers in Makhathini have little choice but to enter contracts offered by Vunisa whereby Bt cotton seed is loaned on the condition that crops are sold back to the company at 20% to 40% of the world market price, putting farmers into a cycle of loans and debt.

There are claims that Bt cotton has led to economic benefits for smallholder farmers in Makhathini. But these claims are heavily influenced by Monsanto. From 1998 to 2000, researchers at the University of Reading (Berkshire, UK) conducted a survey of farmers, who were not chosen from a random sample but handpicked, with the help of Monsanto. Critics point out that farmers spend more money on GE seeds, which are twice as expensive as conventional ones, than they save in pesticide reductions. Other perceived weaknesses are the vulnerability of Bt cotton crops in South Africa to pests like the pink bollworm and jasids (or leafhoppers), and the susceptibility of the crops to American bollworm during the middle and end of season and times of stress (like low soil fertility or minimal rainfall) when levels of Bt toxins are low in the GE plants. In addition, new pests, such as sting bud, have appeared.

Paying off farmers

To make a positive impression on farmers, policy makers and critics, Monsanto has been paying black farmers to promote GE crops. T.J. Buthelezi of Makhathini has been paid by Monsanto to act as an African 'representative.' Buthelezi has spoken of his positive experiences with Bollgard cotton at conferences and events around the world. He has also met with U.S. Congress members and was paid by Monsanto to have lunch with U.S. Trade Secretary Robert Zoellick at the corporation's office near Pretoria. In August 2002 Buthelezi and Monsanto organised pro-biotech booths, interviews and rallies at the World Summit on Sustainable Development in Johannesburg. In May 2003, when Zoellick publicly announced the U.S. challenge against the EU's de facto moratorium at the WTO, Buthelezi's was by his side. While Buthelezi is made out to be a 'small farmer,' he is actually one of Makhathini's largest, with 66 acres of land. Monsanto has also flown four other black South African GE crop farmers to London, where they spoke at a private conference hosted by the Commonwealth Business Council, before heading on to Denmark and Germany.

Source: Monsanto-The GeneGiant, RFSTE/Navdanya/The Polaris Institute

Hope, Hype and Hubris*

Despite the increased area dedicated to growing GMOs as food crops in South Africa, a veil of secrecy remains in place. The Department of Agriculture bluntly refuses to allow public oversight, citing commercial confidentiality agreements with corporations. The department has even gone so far as to use opponents of GMOs as reason to keep locations of GM crops secret, saying that anti-GM campaigners would destroy GM crops if the locations were divulged. These claims are refuted by the fact that many of those opposed to GM know the locations of numerous sites where these crops have been or are being grown and have not engaged in direct action against these crops at any time. Instead opponents of GM technology are far more interested in enabling

South African civil society calls for GMO moratorium

South African civil society renewed its call for a moratorium on GM food and crops in early 2004. The open letter signed by many citizens' groups calls for an urgent moratorium on the trade and growing of GMOs and the implementation of a liability regime that will ensure corporations are responsible for any damage arising from GMOs. The open letter points out that the South African government is yet to implement the minimum standards set out by the Biosafety Protocol while continuing roaring trade in GMOs. For example: During November 2003, the same month the Biosafety Protocol became binding on South Africa, the government authorised the import of 40 749 kg of GM maize and 20 000 tonnes of GM soya beans from Argentina plus 40 000 kg of GM maize from the United States. In January 2004 it authorised the import of 356 310 tonnes of GM maize from Argentina

Source: Biowatch South Africa, February 23, 2004; archive: www.genet-info.org/

BioWatch and SAFeAGE are two advocacy organisations that are working on anti-biotech campaigns in South Africa. BioWatch is involved in monitoring the impacts of GE organisms, SAFeAGE (South African Freeze Alliance on Genetic Engineering, see also below) has launched a campaign that demands a five-year freeze (moratorium) on the growing of GE crops in open fields until the technology is proven safe, environmentally harmless and in the public interests of the people of South Africa and neighbouring countries, as well as on import and export of GE foods and crops and the patenting of genetic resources for food and crops.

independent monitoring and oversight of them in order that the claims made by promoters of the technology can be verified. (...)

Through one of the most expensive PR campaigns ever mounted, Monsanto, Syngenta and other promoters of GMOs have engaged organisations such as AfricaBio, International Service for the Acquisition of Agri-Biotech Applications (ISAAA) and Crop Life as supposedly neutral arbiters. All of these receive extensive industry funding. Due to the sophistication and repetitiveness of the public relations campaign, significant inroads into Africa are being made by lobbying key politicians, funding political parties and generally greasing the wheels to gain permission for the introduction of these products. Similar campaigns are also mounted in an attempt to sway public opinion.

In one of the most comprehensive studies of the technology, Aaron De Grassi, an agricultural researcher working for the Third World Network, looked at a few claims made by promoters of GMOs in Africa. In examining the Makathini Flats (see above) De Grassi exposed the bluster behind this internationally touted project. Here, so-called poor farmers are supposedly benefiting from the use of insect-resistant GM cotton. (...) CropGen, a pro GM lobby group, put the profit gain at $113 per hectare. Monsanto claimed that farmers gain $90. ISAAA says an extra $50 per hectare, university researchers $35, and the survey team found farmers gained only $18 in the second year, but in the first year those who did not use GM cotton were better off than those who did. The very same farmers who are supposed to have benefited from this technology have meanwhile sunk even more deeply into debt. In 1998, before GM cotton arrived, farmers in the irrigation area carried about 16 million rand of debt. Over the next two years this debt burden grew over R 8 million more as farmers

engaged in farming this high-risk, high-cost crop were affected by floods and other natural damage. Prices for cotton also fell. So much for helping small farmers. The real beneficiaries remain the seed companies. The farmers and their state loans remain red ink on South Africa's debit sheet. The promoters have singularly failed to explain the implications of the adoption of GM technology to these small farmers, nor are the required refuges—a percentage of the GM crop area seeded with conventional crops—understood, enforced or monitored in any meaningful way. This will lead to a rapid build-up in resistance among target insects. Monsanto is already running trials on newer, more potent, less tested GM cotton varieties, with far more complex and unpredictable genetic alterations to counter this emerging threat.

The claim that we need GM crops to feed Africa is possibly the most cynical lie that has been perpetrated by an industry already deeply mired in controversy. Since the introduction of this technology into South Africa more than 58,000 cotton workers have lost their jobs as farmers adopted less labour-intensive farming methods such as insect-resistant cotton.

Hunger has become worse than ever for these people and many more South Africans besides. (...) The South African government continues to undemocratically force GMOs on us as consumers while we subsidise their introduction through our taxes at the cost of urgently needed rural infrastructural reform. It is a tragedy that our leaders have allowed themselves to be so thoroughly misinformed by an industry that is engaged in a battle to secure control of global agriculture wherever possible. Big Biotech cares not a jot about the food security of Africans; all that interests them is the corporate bottom line.

**Article (extract) by Glenn Ashton, coordinator of SAFeAGE, a network of individuals and organisations representing over 250,000 South Africans opposed to the import, export and growing of GM crops and food until their safety and desirability have been proven; www.safeage.org.*

Environmentalists want State's GM secrets

Environmental lobby group Biowatch sought a Pretoria High Court order compelling the government to divulge details of all GMOs brought into or manufactured in the country to date. Biowatch launched the court application after repeated failed attempts to be granted access by the Registrar Genetic Resources to sufficient information to allow the organisation to evaluate if GE in South Africa is safe and compliant with national and international environmental standards. Monsanto subsequently tried to ensure that their "rights to commercial confidentiality" were not infringed. An acting judge said that Biowatch is "possibly" entitled to the information it is seeking.

Source: Press Release by Biowatch/Oryx Media Productions, 24 and 26 May 2004.

Kenya, Burkina Faso and Benin are the two sub-Saharan African countries where the biotech industry tries hard to make an entry in the region.

Kenya

Maize: Cimmyt, the Kenya Agricultural Research Institute and Syngenta Foundation are developing Bt maize for Kenya. So far it has not been released and environmental impact studies are being carried out

Potato: Monsanto, the Kenya Agricultural Research Institute (KARI), the US Agency for International Development, Michigan State University and the International Service for the Acquisition of Ag-Biotech worked together to develop a GM virus-resistant sweet potato for Kenya. The field trials of these potato varieties started in 2001.

GM Technology Fails Local Potato

The following shows some of the problems arising with GM potato as highlighted by the Kenya Agriculture Research Institute and the Third World Net Work:

Trials to develop a virus resistance sweet potato through biotechnology have failed. US biotechnology, imported three years ago, has failed to improve Kenya's sweet potato. This has confirmed critic's fears that bio-engineered techniques tried elsewhere may not be replicated in Africa with similar results. The modified potato was launched in Kenya, in 2001 by US special envoy, Dr Andrew Young, who had flown into the country for the occasion.

Investigations, on the transgenic crop, by KARI's Biotechnology Centre, say the technology has failed to produce a virus resistant strain. "There is no demonstrated advantage arising from genetic transformation using the initial gene construct," says a report by researchers, Dr Francis Nang'ayo, and Dr Ben Odhiambo. The transgenic potato was imported from Monsanto in the U.S. to Kenya for tests. The initial genetic engineering work was done at the Monsanto laboratories. In a nine-year study, Monsanto had developed a coat protein responsible for virus resistance, and donated it to KARI, royalty free, to use in its sweet potato improvement programme.

"The transgenic material did not quite withstand virus challenge in the field," says the report, doubting whether the gene expression was adequate or it failed to address the diversity of virus in this region or just that the gene construct was inappropriate. Actually, the report indicates that during the trials non-transgenic crops used as control yielded much more tuber compared to the transgenics. "All lines tested were susceptible to viral attacks."

The KARI results corresponded with an earlier study released by the Third World Network - Africa. The study, titled "Genetically Modified Crops and Sustainable Poverty Alleviation in Sub-Saharan Africa: An Assessment of Current Evidence", by Aaron de Grassi, of the Institute of Development Studies, University of Sussex, UK, had warned that the GM sweet potato introduced in Kenya did not address the crop's major problem - weevils. The study offered new evidence against claims of the miracle

potential of GM crops for dealing with famine and poverty in Africa. After examining the impact of three GM crops, sweet potato, maize and Bt cotton, on poverty alleviation in Africa it concluded that biotechnology does not address the real causes of poverty and hunger in Africa. (...)

Source: allafrica.com/2004

Burkina Faso and Benin

Cotton: Monsanto has started conducting trials on genetically modified cotton in Burkina Faso, the first such tests in West Africa, officials said. The trials started in late June 2003 and are part of a research agreement signed between the company and the government of the impoverished country. The tests involve Bollgard II, the second-generation of insect- protected cotton developed by Monsanto. (A Monsanto official said trials were being carried out also in Egypt.) Monsanto has planted Bollgard II in two research stations in Burkina Faso, which is West Africa's second biggest cotton producer after Mali. The trials aim to measure the yield per hectare and environmental risks.

Reuters, July 18, 2003

Burkina Faso: Citizens demand moratorium

In April 2004 the National Federation of Peasant Organisations organised a workshop on "GMOs and the Rights of Local Communities". The workshop statement says that in 2003 Burkina Faso authorised field trials of GE cotton (Monsanto Bt and Syngenta VIP), and that citizens are worried because the crops were released without anyone being informed of the implications of GE plants and without Burkina having the necessary biosafety legislation in place. Regarding the socio-economic impacts, the cotton variety being field-tested is from the U.S. and the Bt gene that it carries is patented. Even if this gene were transferred into a local burkinabè variety, farmers would not be able to grow it without paying royalties to the company holding the patent. The workshop participants called on the authorities to have a moratorium on the use and commercialisation of GMOs in order to inform the public and assess all the risks related to GMOs.

Source: www. grain.org/research

Benin: Only African country with GMO moratorium

The Benin Centre for Scientific and Technical Research and the National Institute for Agricultural Research proposed a 5-year moratorium on the import, commercialisation and use of GE products. The Benin council of ministers adopted the moratorium on 6th March 2004. It is now in effect.

Source: Gaia Foundation, April 2004

GMO Food Aid

Angola – Sudan - Zambia

Several countries in southern Africa have banned imports of Food Aid of genetically modified whole grain. These countries want to keep the genetically modified products from working their way into their domestic crops. Some countries are willing to allow milled GM maize imports, because milled grain cannot be planted.

Pressure and excuses

The following extracts show US pressure and people's resistance regarding GM Food Aid:

The US pressure on African countries to accept GM food aid continues in Angola. But Angola implemented its rights under the Biosafety Protocol, and told the World Food Programme (WFP) that it does not wish to accept unmilled GM food aid. This means that food aid sent from the U.S, in the form of GM maize, is not acceptable to Angola in grain form. Since the WFP says that it will not be possible to mill the US-donated maize, Angola may have to reject it altogether. Angola has recognised that it cannot compromise its long-term agricultural biodiversity and food security through GM contamination.

In the case of Sudan, the United States Agency for International Development (USAID) threatened to cut off food aid altogether, and as a result, Sudan has relented on its GM food restriction for another 10 months. The WFP were quick to respond to criticism, saying that no pressure had been put on Sudan or Angola to accept GM food aid, and defended their GM donors, the USAID. The African groups maintain their claims, pointing to USAID's own statements about ceasing food shipments to Sudan. They demand that the WFP must provide countries with a real right to choose GM-free food, instead of a false choice between GM and hunger.

Zambia, recipient of pressure and threats in 2002 over their decision to reject GM food aid, can now demonstrate the wisdom of that decision. With a bumper harvest this year, they have in turn been able to provide Angola, Zimbabwe, the Democratic Republic of Congo and Namibia with food aid.

Source: Gaia, April/May, 2004

Letter to the WFP: No to GM Food Aid

Over 60 African groups have signed an open letter to the World Food Programme and the United States Agency for International Development protesting at the pressure to accept GM food aid.

Some people scoffed last year when US trade chief Robert Zoellick claimed lives were at risk because "European antiscientific policies are spreading to other corners of the world," by which he mainly meant to Africa. Yet this week, in a move of startling callousness, Angola confirmed Zoellick's warning when it announced it would reject genetically modified food aid for 1.9 million people displaced by civil war. As The New York Times reported, "Angola follows four drought-stricken southern African nations - Zimbabwe, Zambia, Malawi and Mozambique - in refusing foreign donations of certain genetically modified foods despite widespread malnutrition and even starvation among their citizens."

Source: Rocky Mountain News, 31 March 2004

GM Food Aid – Africa Denied Choice Once Again?

In March 2004, Angola and Sudan introduced restrictions on GM food aid: Sudan requested food aid to be certified "GM-free", Angola said it would accept GM food aid only if whole GM grain would first be milled. Both decisions were strongly criticised by the United States Agency for International Development (USAID) and the World Food Programme (WFP). Constant pressure has been applied to both countries to remove the restrictions. In March despite the Sudanese government having put in place an interim waiver on the GM food restrictions until July 2004, the USAID cut off food aid. The U.S.Government then continued to exert enormous pressure, urging the government of Sudan to provide formal, written notification of a change in GMO certification requirements or a third extension for the current waiver to this policy. The government of Sudan relented, and ended up extending the waiver for six additional months, allowing the distribution of GM food to continue until January 2005. The WFP responded to the Angolan government by saying that the country would face a significant decrease in the provision of food aid if it continued to insist that GM grain be first milled. The scenario presented by the WFP and USAID to these African countries is that either they accept GM food aid or face dire consequences.

USAID and the WFP's actions are unacceptable. The experience of the Southern Africa GM food aid crisis during 2002/03 shows that alternatives to GM food aid exist, even under circumstances of emergency. In October 2002, Zambia faced overwhelming pressure to accept GM food aid. At that time, 2.4 million people were estimated to have been at risk of starvation. Zambia was presented with a scenario of no choice- USAID and the WFP said that GM food aid was necessary to prevent starvation. But Zambia overcame its food crisis without GM food aid, and the country went on to produce bumper harvests of GM free maize the following year. Ironically, since 2003, the WFP has

purchased 100,000 tones of food from Zambia, which it sent to Zimbabwe, Angola, the Democratic Republic of Congo and Namibia.

It is difficult to disassociate the pressure on Angola and Sudan to accept GM food aid from the ongoing aggressive US efforts to promote GM crops in developing countries. Food aid programmes are closely tied to the well being of US farmers. The opening of new markets and surplus disposal is one of the major objectives of the biggest US Food Aid Programme: the US Public Law 480. With the U.S. as the world's number one producer of GM crops and with a growing list of countries rejecting or restricting GM food imports, the food aid programme has therefore become a vehicle for opening markets for US GM food surpluses. (...) Angola was the fifth largest recipient of cereal food aid in the world in 2002/03, after Iraq, Ethiopia, the Democratic Republic of Korea, Bangladesh and Afghanistan.

Angola and Sudan should never have been presented with the stark choice between accepting GM food aid or facing dire consequences. The WFP and FAO have both officially recognised that Sudan has an abundance of food available in the country. Indeed, they have already recommended the purchase of food available on the domestic market. In Angola local non-GM alternatives need to be fully explored such as cassava, beans and sweet potato. Regional and international non-GM alternative sources already exist and these must be fully investigated by the WFP.

Extracts of the Report published by the Africa Center for Biosafety, Earthlife Africa, Environmental Rights Action, Friends of the Earth Nigeria, Grain and SAFeAGE in May 2004.

Asia

From the subcontinent to Southeast Asia GM crops and food make their appearance. So far, three countries are growing GM crops commercially, namely China (cotton), India (cotton) and the Philippines (maize). Field trials have been carried out in various countries. China, Japan and other Asian countries import large quantities of food commodities such as soybeans, etc. from producer countries in the West. More and more Asian people fear GMO food and the resistance against it is growing.

China

China is among the five biggest GM crop growers worldwide and the biggest importer of GMOs. It has signed the Biosafety Protocol but has not ratified it so far. China started growing GM cotton in 1996. Today more than half of China's cotton is GM. Given the sparse information it is difficult to know the latest details about the performance of GM cotton on the ground. According to official information GM cotton is considered a "miracle crop". According to a Greenpeace report of June 2002, laboratory tests and field monitoring conducted by four Chinese state-owned science institutes said that Bt cotton showed adverse environmental impacts after just five years of commercial growing, and concluded that the Bt variety would be ineffective in controlling pests after eight to ten years of continuous production.

Regarding GM food, Chinese citizens are increasingly reluctant to accept GM food products, and they demand controlling and labelling mechanisms.

China imports GM soybean

China awarded its first formal safety certificates for imported GM crops – which allow foreign exporters to ship their GM products to China – in early 2004. Five strains developed by Monsanto, including RoundupReady soybeans and corn, YieldGard Corn Borer, Bollgard cotton and RoundupReady cotton received certificates. In 2003 China imported more than 20 million tonnes of soybean worth US$4.8 billion, a rise of 100% over the previous year. More than 70% of China's imported soybeans are genetically modified.

Extract from SciDev.Net, 5 March 2004; http://genet-info.org/genet/2004/Mar/msg00028.html

Greenpeace survey: China consumers back GMO labelling

Consumers in China, the world's top importer of transgenic soybeans, support labelling of genetically modified products and many would buy non-GMO products if they had a choice. Greenpeace said a survey of 600 people in Beijing, Shanghai and Guanzhou showed 85 percent of respondents demanded labelling of biotech food. It also showed 55 percent would not buy GMO products for their children. While China's rules on transgenic crops require labelling of GMO food, such as soyoil, they do not include highly processed products such as GMO soya lecithin often used in baby mild powder or biscuits.

Source: @griculture news (Reuters), HongKong, 19 April, 2004

Shoppers Guide: Greenpeace launched a True-Food-Now Shoppers' Guide to avoid GE Food in mainland China.

Source: http://www.greenpeacesoutheastasia.org/enseanews102.html

Japan

Japan grows almost no soy, corn, oilseed rape and cotton and is therefore a sought after market by producers and exporters from western countries. Japan does not grow GMO crops commercially, but recent field trials on rice – the country's staple food - threaten Japanese farmers and consumers. Citizens' movements against GMO rice trials and imported GM crops are growing. They demand mandatory labelling systems and call on domestic farmers to locally grow non-GM soy, oilseed rape and corn.

The No-to-GMO-Rice-Movement

In 2003 the following field trials for rice were approved: Kitaake rice, an acidic-soil resistant strain (modified with corn DNA) in Hokkaido, Nipponbare, an animal-feed rice variety in Tsukuba city, and in Kitakami city the Iwate Biotechnology Research developed a cold-resistant rice variety.

The No-to-GMO-Rice-Movement gathers signatures in order to stop rice trial cultivations, as well as the field trials of herbicide resistant soybeans. From June to July 2003, Percy Schmeiser, a Canadian farmer battling Monsanto, came to Japan and gave talks in nine different localities. Farmers and consumers agreed with Mr. Schmeiser when he said that if GM crops were grown in the country, it would be impossible to farm organically within a few years, and farmers would lose the freedom to choose their seeds and their farming methods.

Source: GMR Watch Center, 2003

Declaration of Opposition to GMO Rice (Extract):

Against the wishes of the Japanese who do not want genetically modified foods, the introduction of genetically modified rice into Japan invites insecurity for and a lack of faith in Japanese agricultural products. Furthermore, genetically modified rice is produced overseas in countries such as the U.S. and will surely be imported and sold at low cost in Japan. This will lead to increased difficulty in domestic rice production, the major crop in Japan, and the loss of paddies, land, and agriculture.

GM rice will profit neither the producer nor the consumer. Although the benefits such as reduction of labour and increased flavour and nutrition are often cited, ultimately, this will lead to multinational corporations seizing control of seeds, agriculture and our food supply.

We will oppose the development, cultivation and import/export of genetically modified rice because it ignores food safety, weakens both domestic and global agriculture, and negatively impacts the environment.

Source: GMR Watch Center, 2001

The Soy Trust Movement

Food made from soybeans is an integral part of Japanese meals. Tofu (soybean curd), Miso (soybean paste), Natto (fermented soybeans) and Soy sauce are traditional food items. The Soy Trust Movement – with the aim to raise soya production in Japan – successfully links farmers and consumers. In the last six years the self-sufficiency rate of soy raised from 2% to 5%.

Though few, there are farmers who cooperate with Monsanto to grow GM soy. In 2003 experimental cultivation took place in three locations but all of them were halted due to the opposition of surrounding farmers and consumers. One of the field trial locations was in an area well known for soy and Natto production. To stand up against this move, in January 2004 the Soy Trust held its annual nation-wide meeting in the area and opened it with a Natto party. The Soy Trust plans to expand its activities along with the Slow Food Movement with the slogan "We do not eat or grow GM soy".

Thailand

Thailand does not grow GM crops commercially but comes under increasing pressure to do so. Regarding GM food, in order to help consumers to avoid food items containing GM ingredients, in 2001 Greenpeace Southeast Asia launched a so-called "True Food" list and periodically informs the public about GMO food products being blacklisted.

GM trials

The U.S. is pressing the Agriculture Ministry to go ahead with open-field testing of genetically modified crops and to use biotechnology as a key means to boost crop yield and quality. "The US administration would fully support Thailand in a research on biotechnology, including an establishment of biotech labs and sending biotechnology experts to train Thai officials," agricultural counsellor Rodrick McSherry at the US embassy was quoted as saying during a meeting with Mr. Virachai, chief adviser of the Agriculture Minister. (...) Mr. McSherry insisted that genetic engineering technology was vital for agricultural development in developing countries, including Thailand. GMO products were also proved safe for human consumption, he said. "We will move forward with research on biotechnology, beginning with seeking cabinet approval for a GMO field trial in a contained area of the Department of Agriculture's research station, Mr Virachai said. However, he added that it was still a long way off before the ministry allowed commercialisation of GM crops. Thai negotiators also told US

officials about rejection of Thai agricultural products by the European Union. Thai agricultural products, including canned tuna in soybean oil and poultry, used to be rejected by the EU because GMO traces were detected in them. It was possible Thailand would soon cancel imports of soybean and maize from the U.S. to avoid losses in the EU market. (...)

Buntoon Srethasiroj, of the National Human Rights Commission's panel on biological resources conservation, said the Agriculture Ministry should consult other relevant agencies, such as the National Biosafety Committee and the Natural Resources and Environment Ministry, before joining the US' pro-GMO policy. He also said the ministry's support for GM crop cultivation would hurt the government's policy on food safety because many consumers believed GM food products were unsafe.

Source: The Bangkok Post, Thailand, 7 January 2004; http://www.bangkokpost.com

The Philippines

In December 2002 Philippine authorities approved Monsanto's Yieldgard corn - making the Philippines the first Asian country to approve commercial growing of Bt corn. Monsanto had been relentless in its efforts to get its Bt corn approved. Several bills seeking to regulate genetically engineered crops were submitted to Congress but have not made progress because Monsanto and AGILE (a lobby group that receives USAID funds) have been trying to block the passage of these bills.

Protest against Bt corn

Monsanto used illegal field trials for Bt corn. NGOs sued Monsanto and Pioneer Hi-Bred for these illegal trials. The companies failed to appear in court until the field trials were over, the crops harvested, and the case was moot. In August 2001, activists resorted to direct action. Close to 800 farmers, indigenous Lumad people, students and others participated in "Operation Bunot (uproot)," pulling all of the Bt corn plants from a 1,700 square metre experimental field owned by Monsanto's Agroseed in Maltana village in southern Philippines.

Farmers, through organisations like the Philippines Peasant Movement and Resist and other groups have been actively protesting the testing and commercialisation of Monsanto's and Pioneer's Bt corn. They argue that Bt corn is not helpful to them since it is intended for feeding animals for the meat industry and not for direct human consumption. They also say that the infestation of corn borers is not a serious problem in the southern Philippines, where field trials occurred, and peasants have been able to manage the pests on their own. A group of environmentalists went on a month-long hunger strike outside the Department of Agriculture to demand a moratorium on the commercialisation, sale and planting of GE crops.

Source: "Monsanto-The GeneGiant", RFSTE/Navdanya/The Polaris Institute

Resist!

RESIST is the largest anti-GE alliance in the Philippines. It includes farmers' organisations, non-governmental organisation, scientists, health workers, and academics. In June 2003 RESIST launched a national boycott campaign against Monsanto. The campaign calls for farmers to boycott Roundup herbicides, Harness herbicides (corn), Machete herbicides (rice), Asgrow seeds, DEKALB seeds, Hartz seeds, Yieldgard corn, Bollgard cotton, Ingard corn and Roundup Ready corn.

Indonesia

Indonesia was the first country in Southeast Asia to test GE crops. The starts was as follows:

Bt cotton in South Sulawesi

On 15th March 2001 40 tonnes of Monsanto's Bt cotton were flown into South Sulawesi. The seeds, to be sold to farmers in South Sulawesi, were imported from South Africa by Monsanto's Indonesian subsidiary PT Monagro Kimia.

Activists protested the government since the seeds had not gone through the required quarantine process before being released to the public. The shipment of seeds came only five weeks after a decree was signed by the Minister of Agriculture, which allowed for a limited release of Bt cotton in seven districts in South Sulawesi. Meanwhile even before the decree was signed, PT Monagro Kimia had conducted secretive field tests for Bt cotton in two districts in South Sulawesi, involving 600 farmers and 500 hectares of land.

Farmers deceived in field test

Prior to the secretive tests, extension workers from the country's Agricultural Service told farmers that Bt seeds would produce higher yields – as many as four tonnes of cotton per hectare in any kind of soil – and lead to greater profits. (Meanwhile, local varieties of seed, which the farmers usually planted, had become hard to find. Some farmers felt that this was a false shortage created to force farmers to try Bt cottonseed.) Farmers, who were required to buy the Bt seeds for the tests, were also told that PT Branita Sandhini, a subsidiary of PT Monagro Kimia, would buy the crops.

After several months of growing Monsanto's Bt cotton, the farmers realised they had been deceived. They did not see larger yields. Only 2% of the farmers produced four tonnes per hectare, while many farmers had yields of only 70 to 120 kg per hectare. (Data from the Ministry of Agriculture indicate that cotton production in Indonesia yields 400 to 500 kg per hectare annually.) PT Branita Sandhini refused to buy the farmers' crops. When they tried to sell their cotton to other buyers, none were willing to buy it because they were afraid of retaliation from PT Branita Sahhini. In desperation, farmers burned the cotton. The situation was particularly bad for farmers who had shifted from growing food crops to Bt cotton, hoping that it would provide them with sufficient returns.

Source: "Monsanto-The GeneGiant", RFSTE/Navdanya/The Polaris Institute

Three years after the first Bt cotton seeds where flown into South Sulawesi, Indonesian NGOs call for a GMO ban:

Supreme Court urged to ban GMO

A coalition of environmental non-governmental organisations has urged the Supreme Court to rule against the government's policy allowing genetically modified organisms (GMOs) to be planted in Indonesian soil. Executive director of the National Consortium for the Preservation of Indonesian Forest and Nature, Tejo Wahyu Jatmiko, told The Jakarta Post that the policy violated an existing law on environmental management. "We hope the Supreme Court will deliver its verdict soon," Tejo said, and added that the NGOs had initially filed a lawsuit with the State Administrative Court against the Ministry of Agriculture in September 2001. The lawsuit challenged the ministry's decision to grant a license to PT Monagro Kimia to distribute transgenic crops. Monagro is the Indonesian unit of the US-based genetically modified crops producer Monsanto Co. The coalition lost the first and second round of its legal battle and decided to appeal to the Supreme Court in March 2002. Tejo explained that the decision by the ministry in granting a license for Monagro to distribute and plant genetically modified crops was against Environmental Management Law No. 23/1997. He said that according to the law, Monagro should have completed an environmental impact assessment first before the Ministry of Agriculture could issue the permit.

Source: The Jakarta Post, Indonesia, 25 March 2004

India

India has allowed commercial growing of Bt cotton and field trials for other plants. Strong movements of farmers, consumers, NGOs and scientists forcefully oppose GMO crops and food.

Monsanto violates biosafety laws

Since 1998 Monsanto-Mahyco has been engaged in Bt cotton field trials in India. Monsanto started large-scale open field trials without the permission from the Genetic Engineering Approval Committee (GEAC) even though it is the sole agency to grant such permission. The Research Foundation for Science, Technology and Ecology (RFSTE) immediately challenged these trials. Because of the illegality of the trials, which violate India's laws on biosafety and because of the risks of genetic pollution RFSTE was forced to take Monsanto and Mahyco to the Supreme Court.

In spring 2002 the Genetic Engineering Approval Committee (GEAC) of the Ministry of Environment and Forest gave clearance for the commercial planting of three Bt cotton varieties in Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Tamil Nadu (central and southern India). The clearance was granted in spite of the fact that the GEAC was aware of Monsanto's violations of biosafety guidelines during the trials and in spite of the fact that the Supreme Court case filed by RFSTE - challenging these trials - was still ongoing.

Bt cotton: Failed promises

Bt cotton was cleared on the ground that it had been fully tested in Indian conditions, that it would not require pesticides, that yields and therefore farmers' incomes would be higher. Non of these promises were fulfilled as a study undertaken by the RFSTE in fall 2002 showed (the complete study is available with RFSTE). Main findings of the study regarding the performance of Bt cotton are:

No pest resistance: Bt cotton was devastated by pest attacks – by bollworm as well as by sucking pests. Farmers had to resort to spraying several times.

No higher yield: Yields could reach a maximum of 4 quintals per acre, often it was less - a far cry from the 15 quintals per acre as claimed by the Bt cotton sellers. Non-Bt hybrid cotton could yield between 12-15 quintals. Bt cotton plants held around 60 bolls per plant as compared to non-BT ones with 200-250 bolls. Bt plants matured and died much before non-Bt plants.

No higher income: Seeds and pesticide costs for Bt cotton are higher than for other hybrids. Local varieties cost little since the farmers save their own seeds and no chemical pesticides are used. Costly inputs and low yields made the Bt cotton farmers loose huge sums in one cropping season. What added to the catastrophe was the low

rate farmers could fetch for their crop because Bt plants produced short staple cotton with the lowest market value.

No biosafety: The GEAC indirectly admits that Bt cotton is not safe since it has stipulated that farmers sowing Bt cotton must plant 20% of their fields with non-Bt varieties. This should help to minimise the pests' resistance to Bt toxin, and to check genetic pollution and contamination through cross- pollination. (By the way there is great confusion as to what is the distance of pollen transfer. It varies from 2 metres to 3 miles!) Not GEAC, not Monsanto-Mahyco but the farmer is made responsible to meet these "safety" requirements. Every farmer who bought Bt cotton seeds was made to sign that in case he wouldn't follow the conditions laid down by GEAC he would attract penalties under the Environment Protection Act.

Crop 2003/04: Bt cotton fails again

In the season 2003/04 the Deccan Development Society undertook a study on the performance of Bt cotton in three districts of Andhra Pradesh. The study came to the conclusion that - even though the overall yields were marginally more for Bt cotton - the overall benefit cost ratio is in favour of non-Bt hybrids:

- Bt seeds cost 230% more than non-Bt hybrids
- The total investment for Bt was 8% higher than for cultivation of non-Bt cotton
- The reduction in pesticides consumption of farmers growing Bt cotton was just 12%
- Net profits from Bt cotton was 9% less compared to profits from non-Bt hybrids.

Bayer GM mustard: No must at all

Since 1998, multinational companies PGS-Aventis-Bayer and the Indian ProAgro have carried out field trials with GM mustard. The industry is putting pressure on the GEAC to have GM mustard cleared for commercial planting. Due to demands from various citizens' groups, including Navdanya, GEAC has not yet given the respective green light.

GM mustard is engineered to be resistant to the so-called glufosinate herbicide – a substance, which can be dangerous to humans and animals because it affects the nervous system. During the genetic transformation of mustard an antibiotic called kanamycin is added. This antibiotic is also used to treat infections in humans. Due to increased exposure to kanamycin through GM mustard products, infections could become resistant to it.

Mustard is vital to the Indian food and health culture. Mustard/Rapeseed is highly pest resistant and grows even in dry regions, which makes it a cheap and safe crop for farmers. Millions of Indians use mustard oil daily. Mustard is widely used in food preparations, as a medicine and as a spice. The companies claim that GM mustard yields 20% more seeds and oil such providing farmers with additional income. So far researchers say that there is no proof to ProAgro's claims to higher yields. The real reason for pushing GM mustard is that industry wants to sell the Bayer herbicide glufosinate to be used on GM mustard in a big way.

Roundup – Ready for what?

Monsanto has carried out marketing offensive in the drought-prone, maize-growing regions of Rajasthan - disguised as a programme to improve the living standard of small and marginal farmers. By co-opting an NGO and the College of Agriculture, "solution packages" in the form of Monsanto maize varieties are pushed and farmers are encouraged to take up industrial maize farming. The varieties used are not (yet) genetically engineered. But they are chemically intensive hybrids "in need" of Roundup herbicide. Such Monsanto prepares the ground for the later introduction of its next package: RoundupReady maize plus Roundup glyphosate herbicide. The company's claim of ensuring food security in the region is false: Monsanto varieties need extra water and such contribute to drought; yields are lower than promised and production costs much higher than for formerly used local varieties.

The protein potato hoax

India's Department of Biotechnology (DBT) would like to launch a "protein potato" According to DBT, this potato contains one third more protein than a normal one because a gene from the protein-rich amaranth plant is added to it. The DBT thinks it is a good idea to incorporate such GE potatoes into the governments free midday meal programme in schools. There is, however, no need for GM potatoes at all. The nutritional value of amaranth is richer in protein, calcium and iron than the same amount of GM potato. Poor Indian children could get a balanced midday meal by being given amaranth and indigenous dals and pulses instead of "protein rich" GM potatoes.

There is not application for GM potatoes in GEAC yet. Navdanya and other citizens' groups will carefully monitor the situation and watch if the DBT through its agency the Review Committee on Genetic Manipulation would repeat the blunder committed in the case of Bt cotton when it cleared large scale open field trials usurping the jurisdiction of GEAC.

Citizens fight GMOs

Out with Monsanto! : In 1998 the Karnataka State Farmers Association launched its **Operation Cremate Monsanto** campaign in response to secretive plantings of Bt cotton. Farmers burned entire fields of Bt cotton trials. The Genetic Engineering Approval Committee has even had to order that illegal test plots of Monsanto's Bt cotton be destroyed.

The **Monsanto Quit India** campaign by a coalition of NGOs was also launched in 1998 - symbolically on the 9th of August, the anniversary of the day that Gandhi told the British to "Quit India". The campaign started as a response to Monsanto's purchase of Mahyco (the largest Indian seed company), the takeover of a lab in the Indian Institute of Science in Bangalore (India's premier research institute), the free import of GE soybeans and the illegal field testing of Monsanto's Bollgard cotton. Postcards were distributed to NGOs, community groups and farmers across India. Within four months of the campaign launch, more than 10,000 people signed and sent the postcards to Monsanto's headquarters in St. Louis.

Bija Satyagraha

The movement to defend people's freedom and rights on seeds, biodiversity and indigenous knowledge.

Founded in 1999, Bija Satyagraha refuses to accept the colonisation of life through patents and GM technology by multinationals, and the destruction of the food security by the free trade rules of WTO. The Satyagraha is "an expression of the quest for freedom for all people and all species, and an assertion of people's food rights".

In 2003 Seed Satyagraha had a major victory in saving seeds when it could stop the biotech giant Syngenta from bringing into its possession Dr. Richaria's precious and priceless collections of 22,972 varieties of India's rice paddy. Under the "Chattisgarh Seed Satyagraha" thousands of workers, peasants, women and youth protested vehemently and made Syngenta call off the deal.

Biosafety regulations: Not the business of the industry!

The Research Foundation for Science, Technology and Ecology was among the organisations invited to provide inputs to the M.S.Swaminathan Task Force on the application of biotechnology in agriculture submitted to the Ministry of Agriculture.

RFSTE's main inputs to the Task Force were:

- India's Biosafety Framework needs strengthening, with higher capacity in GEAC.
- India is a biodiversity rich but a land of small and poor farmers. Genetic Engineering technology, evolved for application on the giant subsidised farms of the U.S. based on monocultures, has much higher risks in India's ecological and economic context. Hence, GMOs introduced in the U.S. should not be blindly introduced without fresh risk assessment.
- Democratic participation and transparency needs to increase since crops and food are related to fundamental rights and basic needs. Citizens must have the final say on what food they want to eat.
- Organic Farming is the farming of the future. Organic has the potential to produce more with less, and hence reduces the costs and debts, which are pushing farmers to suicide.
- Organic producers need to be protected from genetic contamination and genetic pollution through a system of strict liability.

We oppose the Task Force's recommendations to bypass GEAC in approval of GM Crop varieties and to substitute Biosafety expertise with a Biotechnology expert, as well as the recommendation that once a gene is declared safe, its derivatives or other crops, need not be evaluated for biosafety. Reference to Navbharat 151 seeds in Gujarat as "Illegal Bt Cotton Seed" in the Swaminathan report indicates that the Task Force is a mouthpiece of Monsanto. Navbharat seeds were not genetically engineered. The Bt genes in it are most probably a result of contamination of the seed stock. This needs stronger biosafety and liability, not stronger Intellectual Property Rights as the Task Force recommends.

Extract from a Press Release by Dr. Vandana Shiva/Afsar H. Jafri, RFSTE, India

Gene Campaign India

Gene Campaign, one of the Indian campaigns against GMOs, filed public interest litigation (PIL) in the Supreme Court of India on 7th January 2004. The PIL challenges the constitutionality of the rules for the manufacture, use, Import, export and storage of hazardous microorganisms, genetically engineered organisms or cells that have been framed under the Environment Protection Act. Further, the PIL alleges that the rules in India have not been brought in line with the Biosafety Protocol of the Convention on Biological Diversity, to which the Indian Government is bound, being a signatory.

Extract from http://www.indiatogether.org/2004/apr/agr-scgenepil.htm

Victories for citizens

On April 25, 2003, the Genetic Engineering Approval Committee (GEAC) under the Ministry of Environment and Forests, Government of India, **denied commercial clearance to Monsanto's Bt cotton for the northern Indian states**. This vindicates the apprehensions of the RFSTE and others that have warned the government about the severe repercussions to Indian farmers and their livelihood if further clearance to the Bt cotton had been allowed in view of its large scale failure in the first year of its commercial planting.

This is a third consecutive victory for the people for their food security and food safety after the **denial to ProAgro-Bayar for the commercial clearance of GE mustard** as well as **the rejection of 10,000 million tons of food aid suspected of containing Bt StarLink corn, which** CARE India and Catholic Relief Services wanted to bring into India. These victories were achieved despite the massive media campaign in favour of transgenic mustard by ProAgro-Bayar. And – regarding food aid - despite the massive pressure from USAID and the US Embassy.

GMO Food and Food Aid, India

According to law all foodstuff imported, sold or used containing GMOs should be approved by the GEAC. But this rule is easily bypassed since GM ingredients are hidden in all kinds of food, without being labelled or stated as such. Only by testing each individual item can GMOs be detected – a truly Herculean task.

An example:

GM Potato Crisps and Baby Food

In a press conference held in New Delhi in 2001, Greenpeace announced that GE food had illegally entered the Indian market and provided evidence that two popular products contained GE ingredients. Tests conducted by an independent laboratory, Hong Kong DNA Chips, showed that Procter and Gamble's Pringles Potato Crisps and Abbott Laboratories Isomil Baby Food, both manufactured in and imported from the U.S., contained GE ingredients. Tests very specifically showed the presence of Monsanto's Roundup Ready crops in both the products. According to Indian law it is illegal to import or sell any genetically engineered food products without the prior approval of the Genetic Engineering Approval Committee. After checking with the GEAC, Greenpeace found neither Abbot nor Procter and Gamble had applied for a permit.

Food Aid

No GM food for the hungry

Some years ago, the aid agencies, CARE-India and Catholic Relief Services had imported a corn-soya blend for emergency relief after a devastating cyclone in Orissa. The RFSTE tested samples of this blend and found that it contained GM corn. The National Alliance of Women for Food Rights, a network of all women's organisations working on women and children's food rights, than started a campaign to stop the dumping of GM food in the name of relief and aid. The government responded by banning such imports.

In early 2003 the same agencies tried once more to put pressure on India to allow the import of tons of Food Aid containing the same corn-soya blend. The results was negative - thanks to the protest from women's and other groups, which made it clear that there is no need to import food, and certainly no GM maize. And that, if aid agencies wanted to help the Indian poor, they could buy nutritive crops for the needy right in the country since the godowns are full of food grains.

Sources: All the information in the India chapter (unless stated otherwise): Dr. Vandana Shiva and the team of the Research Foundation for Science, Technology and Ecology, New Delhi, and Navdanya.

Australia and New Zealand

Australia

The only commercially grown GM crop in 2003 was cotton, which was planted in the two states of New South Wales and Queensland on approximately 100 000 hectares. Australia also has a small GM carnation crop. GM canola development and testing was pushed by competitors Monsanto and Bayer CropScienes.

According to the Organic Consumer Organisation five years ago Australia was "part of the Miami Group" and as such one of the countries most aggressively promoting GM crops. Things have changed drastically. Even so the federal government was supportive of GMOs and was willing to give the go-ahead for the first commercial GM canola crop in 2004, citizens and state governments voted otherwise. Several states have declared to ban GMOs or called for a moratorium.

Cotton ban remains in Northern Territory

A ban on the commercial growing of cotton in the Northern Territory will remain in place until September 2004, despite lobbying of the Government by industry officials. The Territory Government put the ban in place last November, to give it time to further research the impact of genetically modified varieties and the impact of the crop on the environment.

The (government's) Gene Technology Regulator is calling for public comment on proposals to plant three types of GM cotton in several jurisdictions, including the Northern Territory. Dow AgroSciences Australia want to plant 10 hectares of herbicide-tolerant cotton on 25 sites. A spokeswoman for the Regulator says even if the trial is approved, the Northern Territory Government can stop it.

Source: Australian Broadcasting Corporation, 8th March 2004

And the bans continue:

Western Australia and Victoria ban GMOs

In March 2004 Australia's largest state, Western Australia, banned all GM crops. Western Australian's Premier said that GM crops would be banned because the state's farmers should continue to market GM-free produce and seek out new markets with confidence.

Also in March 2004 the state of Victoria opted for a four-year GM moratorium on commercial GM crops, such continuing its former three-year moratorium. Victoria's Premier said this decision would protect the state's "clean and green image". He added that he wanted Victoria's grain and dairy production worth $3,5 billions of export to remain "sound"

Source: http://www.organicconsumers.org/ge/australia032604.cfm

Australian Canola

Australia is the second largest canola exporter in the world after Canada. For 2003/04 the Australian Bureau of Agricultural and Resource Economics forecasts a national crop of 1.6 million tons. Canola exports earn Australia just under half a billion US dollars annually. No wonder, the biotech industry tried to grab a share. But while Bayer CropSciences (as of mid-May 2004) says it has no plans to abandon its Australian breeding and testing of GM canola, Monsanto made quite a stir by pulling out.

GM canola: Monsanto backs out

With so many Nos to GMOs, Monsanto opted out of its Australian GM canola project – (only two days after the worldwide pull out of its GM wheat project). This despite of the fact that the federal Regulator had approved GM canola - as the only food crop – for commercial planting. Friends of the Earth called this a major blow to the biotech industry brought about by massive opposition to GMOs, and the group GeneEthics welcomed Monsanto's decision saying GM canola crops would have been a huge environmental and economic disaster.

Monsanto announced its withdrawing saying that, regarding recent legislations in various states prohibiting the use of GM canola, further investments would be unjustified. Monsanto Australia's Communications manager, Mark Buckingham, said that restrictions on GM trials in many states have made their GM plans financially unattractive.

Source: BBC Science Correspondent, 13 May 2004

New Zealand

The group "GE-free New Zealand" was quick to point out the country "risks squandering the opportunity of the century" if they would not follow Western Australia's example and declare New Zealand a GM-free zone, in order to secure its market chances. And added, that this opportunity is threatened by the government's refusal to restore the moratorium on GE release.

Citizens protest against end of GMO ban

To demonstrate against the ending of the ban, nine thousand people marched to the capital calling for the moratorium to be preserved. One group walked 930 miles around North Island and another set up camp opposite the parliament in Wellington. Members of the organisation "Mothers Against Genetic Engineering" demonstrated naked outside the parliament. Maori groups were vocal in opposing GM crops since many regard traditional agriculture central to their identify.

Source: CropChoiceNews-The Guardian, 30 October 2003

New Zealand agrees to field trials after two-year ban ends

A few years ago, small field trials mainly on potatoes, pine and clover were carried out. NZ banned GM crop trials in 2001, in order to assess the impact of GM crops. The ban was lifted end of October 2003. Since that date the government's Environmental Risk Management Authority has allowed several field trials such as sugar beet, potatoes, maize and others. So far no commercial release of GM crops has been granted.

Two third of New Zealand's export earnings come from agriculture, horticulture and forestry and there is every reason to stay GM-free in order not to damage the country's reputation for high quality,"green" products.

Sources: New Zealand Herald; http://www.newfarm.org/international/news/110103/110303/nz_gm_go.shtml.

More citizens' protests: NO to chicken fed on GE feed

In March 2004 GE-free-New Zealand-campaigners were arrested while demonstrating against the contamination of Ingham's chicken with GE feed. Ingham is the largest importer of GE feed in the country and the company knowingly uses GE feed for its chicken, which are supplied to McDonalds. It seems that Ingham plans to also supply restaurant brands like KFC, Pizza Hut and Starbucks starting July 2004.

GE-free-NZ plans for more action days to come.

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Europe

The EU

As a result of warnings by scientists regarding GM crops and food and mounting public opposition, in 1998 some EU member states declared that they would not authorise GM crops and food products until the directive for the release of GMOs was revised and labelling and traceability systems were put in place. Other EU states adopted a very cautious approach regarding GM crops and food. What followed was a de-facto moratorium by the EU, which the U.S. would not accept and in 2003 filed a suit at the WTO.

On 19th May 2004 the European Commission gave green light for Bt11 corn by Syngenta to enter the market. This is the first such approval since 1998, and as such the de-facto lifting of the moratorium. As the "approval date" was approaching, there was widespread public opposition, and many environmental and public interest groups handed in their recommendations, protest notes or hundred thousands of signatures collected from citizens in various countries.

Regarding GM food the new EU regulation, that has to be applied in every member country, reads: Each food product that contains 0.9% or more ingredients of genetically modified organisms has to be labelled accordingly.

For the complete overview of the EU/US case, the EU regulations of GMO release, GM foods an seeds as well as the labelling and traceability, see the Legal Framework for Biosafety and GMOs.

The new decisions regarding GMOs taken at EU level will hardly bring about change in public opinion, which largely reads: **No to GM crops and food**:

Save our Seeds

In early May 2004, the Save our Seeds movement, composed of hundreds of farmer and ecologist groups, trade unions and cooperatives handed a 200 000 signature petition to the European Union Environment Commissioner while the commission was preparing for their directives on GM seeds. In the petition, Save our Seeds calls for the strictest possible labelling of GM seeds. Save our Seeds does not agree with the commission authorising the „accidental or technically inevitable" presence of between 0.3% (rape oil seed, maize) to 0.5% (potatoes, cotton) of GMOs. The group says that these thresholds of tolerance are going to lead to massive contamination in agriculture and massive problems for farmers.

http://www.eubusiness.com/afp/040503172436

What follows are a few examples regarding the status of and discussions around GMOs, in some European countries:

GE-free zones: The new feel-free-feeling

(For details see Legal Framework for Biosafety and GMOs, p. 90.)

It's growing like a healthy GE-free plant - strongly, steadily and beautifully. The GE-free-zone-idea is spreading all over Europe. In Austria, Belgium, France, Greece, Italy, Slovenia and the UK it's already very visible, in over a dozen more countries it's taking shape. Friends of the Earth Europe has launched a campaign to demand better legal protection for areas wanting to ban genetically modified crops.

There are/have been three countries in Europe which grow/have been growing a substantial amount of GM crops namely Bulgaria (maize), Romania (soybeans) and Spain (maize).

Eastern Europe

The ten new members that joined the EU in 2004 have to adhere to the same regulations regarding GMOs as the "old" ones. Among them is Poland, the biggest Eastern European agricultural country, which has been planting some GMOs since several years.

The agro-industry has been accused several times, of making the entry of GM crops and food into the EU through eastern European states. Romania and Bulgaria who wish to join the EU in 2007 have been targeted by the biotech industry since several years. The fact that Bulgaria grows GM maize and Romania grows GM soybeans leads to conflicts in the region. Serbia accuses Romania of contaminating its GM-free crops. For Hungary, which is considered a GM-free seed producer and therefore has a good export market to Western Europe this is also a sensitive issue.

Bulgaria

Monsanto sows Bt corn

In 1998, Monsanto (along with DuPont's Pioneer and Novartis, now Syngenta) applied for permits to commercialise GE crops in Bulgaria. By 1999, Monsanto's RR corn and Yieldgard corn were being planted. Corn is Bulgaria's main export crop. Bulgaria was then caught between aggressive GE seed pushers like Monsanto, and corporate food processors and commodity traders who wanted GE free products for the EU market.

In 1996, Bulgaria became the first country in Eastern Europe to establish regulations for the biosafety of GE plants. (This regulation is, however, based on a law from 1958 on Seeds and Seed Material that was not required to be passed by the parliament). With regulations in place Monsanto was confident to seek approval in Bulgaria (Monsanto is reluctant to initiate GE experiments in the complete absence of any regulations). The advantage for Monsanto is that Bulgaria does not require public access to information and participation when it comes to GE products. Monsanto's initial interest in Bulgaria was related to the fact that the country had then not been

officially invited to join the EU and was therefore not expected to harmonise its regulations with those of the EU. (Bulgaria was officially invited to join the EU in 2000 and is supposed to become a member in 2007).

There are conflicting reports regarding the commercial growing of GE crops. In 2001, the government said that since 1998 only field trials of GE corn had been taking place. But in 2000, Panacea, a seed distributor in Bulgaria, was selling Monsanto's RR corn seed to farmers for $(USD) 907 per package, which contained 5 packets of seed (each containing 80,000 to 100,000 seeds) and 30 litres of Roundup herbicide.

Spain

Withdrawal of Bt176 corn by Syngenta

Spain, the only EU member country where GM maize was commercially grown, has banned the planting of the corn variety Bt176 by Syngenta in January 2004 because of fear that it might generate resistance to antibiotics.

The Spanish Food Safety Agency stopped planting Bt176 at a request of the European Food Safety Authority. Syngenta has sold the Bt 176 corn in Spain since 1998 and it was planted on approximately 20,000 hectares.

Syngenta wants to replace the withdrawn Bt176 with Bt11 corn. But the French and Belgium expert committees have both refused to approve Syngenta's Bt11 corn, saying that Syngenta has not performed sufficient toxicological tests with the actual GMO but mainly provided the results with a Bt11 fodder maize. Both expert committees have demanded full toxicological studies with the GMO for which the approval is requested.

Sources: http://www.gmwatch.org/archive2.asp?arcid=3344;http://www.thecampaign.org/News/april04q.php

UK

Bayer scraps GM maize plans in the UK

No GM crops are likely to be grown in the UK until at least 2008, after Bayer CropScience announced they have shelved plans to commercialise their GM maize ChardonLL.

The GM maize had been given conditional Government approval and such could have been commercially grown in the UK. But Bayer admitted that the crop "is now economically non-viable" because of restrictions on its cultivation proposed by the Government.

Serious question marks over the safety and performance of the GM maize were revealed during the "seed list" hearings, which took place in 2000-2002. Friends of the Earth forced these hearings after attempts were made to place the GM seed onto the UK national seed list, the final hurdle to commercial growing in the UK. Over 220 individuals and 60 organisations took part and gave written and oral objections, temporarily preventing the seed going onto the list. The crop has been the focus of a long-running campaign ever since.

Victory for Friends of the Earth

The decision to withdraw Chardon LL is a significant victory for Friends of the Earth and other campaigners, and a blow to Bayer CropScience and the GM industry at large. After 14 years of research and development in the UK no commercial growing for any GM crop has been achieved. It is also an embarrassment for the pro-GM Blair Government.

Source: Friends of the Earth

UK Five Year Freeze on GE and patenting in food and farming

The Five Year Freeze was launched in February 1999. The 125 supporting organisations called for a minimum five-year freeze on:

- Growing genetically modified plants and the production of genetically modified farm animals for any commercial purpose;
- Imports of GM foods, plants, farm crops and farm animals, and produce from genetically modified plants and animals;
- Patenting genetic resources for food and farm crops.

The movement asks for a system where people can exercise their right to choose products free of GM and for public involvement regarding the decision on the need for and the regulation of GMOs. It lists precautions to be taken in order to prevent pollution and to safeguard people's health, and it calls for proper assessment regarding all aspects of GMOs.

In March 2004, the Five Year Freeze declares that "set against a background of an apparent push towards commercialisation by both the UK government and the European Commission against the clear wishes of the majority of their citizens, the Freeze campaign has received an overwhelming mandate from our supporters to continue the campaign for a moratorium". And adds: "In the light of this evidence, the Five Year Freeze renews our call on the Government to enforce a moratorium on the commercial use of GM food and crops in the UK. The moratorium should remain in place until the questions that remain about the technology have been adequately answered and the required statutory regulations are in place to ensure consumer choice."

Source: Position Statement Five Year Freeze; www.fiveyearfreeze.org

Where the European Gene Giants have their seat:
Bayer CropScience and Syngenta two important global GE players have their headquarters in Germany and Switzerland.

Germany

In Germany - the seat of Bayer CropScience – the picture regarding GM crops and food varies. On the one hand, the first 25 tons of GM maize have been sown. The law on GMOs basically makes it possible to do that. On the other hand at least 70% of the population do not want any GM food.

Opposition against GMOs is very strong. In spring 2004 GMO opponents destroyed a Syngenta wheat trial field. More peaceful but particularly visible are Germany's organic farmers. They put up over 25 000 boards in their fields that read: "We work without genetic engineering." With this measure the farmers want to inform the public on which fields GE has no chance.

Switzerland

Switzerland, a non EU-member country and seat of Syngenta has it all in a nutshell: The citizens' opposition against GMOs, and the industry, which puts pressure on research institutes. In 2000, the Swiss Agency for Environment, Forest and Landscapes denied the Federal Institute of Technology's (ETH) application for GM wheat field trials. After years of legal battle in and out of court, the Agency had to give in. In 2004 the ETH went ahead with a contained GM wheat trial.

Swiss GM moratorium

Following the Swiss government's decision not to implement a GM moratorium, in 2003 the Swiss Farmer's Union, together with Pro Natura and Greenpeace, launched a people's initiative for a GM moratorium. Within four months they collected 120 000 signatures. In September 2003 the initiative was submitted to the government.

Slow food: Italy, France and more

Slow Food is a wonderful movement coming from the lands famous for their food - Italy and France. The cradle of Slow Food is Italy, and in 1989 an international movement was founded in Paris. Today Slow Food has ten thousands of followers in many countries.

The main thrust of Slow Food is to preserve and encourage traditional foods (including the food plants and saving seeds), beverages and recipes that are "endangered by McNuggets and Monsanto," says Carlo Petrini, initiator of Slow Food, referring to the obsession with unhealthy fast food and the increasing and uncertain role of biotechnology. And he adds: "It's a union of education, politics, environment and sensual pleasure."

Latin America

Argentina is the second largest producer of GE crops in the world. Monsanto pushed Brazil, a major agricultural producer, with soybeans being a main crop into growing GM soya. And citizens' groups in Mexico struggle to prevent their maize from contamination.

Argentina

Argentina, which in 2003 has planted nearly 14 million hectares of its land with GM soybeans, maize and cotton, is not the success story told by the bio tech industry. The problems and snags are enormous. And the number of small farmers who have completely lost out is much too high.

Argentina has not signed the Biosafety Protocol and is supporting the U.S. in its suit at the WTO against the European GM "moratorium".

There are, however, citizens groups, like the Grupo de Reflexion Rural, who are trying to fight Monsanto and demand from the government to be obliged to its people instead of pleasing the biotech industry and the U.S.

Argentina: Pull out of the GMO trade war!

The Grupo de Reflexion Rural, an environmental NGO, launched a campaign on behalf of the people of Argentina to demand from their government to pull out of the US-led complaint at the WTO trying to force Europe to accept GMOs. They have also asked organisations like Friends of the Earth to support that cause by sending emails to the Argentinean Ambassadors in the various countries asking them to persuade the Government of Argentina to withdraw from this complaint.

Monsanto threatens Argentina

Monsanto announced that it would end soybean seed sales in Argentina due to piracy concerns, and the increased use of illegal biotech soy seeds. Associated Press reported that the company is unable to recoup its investments because of a huge black market for genetically modified seeds. (It is estimated that 50 to 60 percent of all soybean seeds in Argentina are bought on the black market). Unless the government combats illegal seed sales, Monsanto Argentina said it would not sell new and improved soy seeds or carry out research to develop new varieties tailored to local conditions.

Source: CropBioTechNet, 2004

Argentina Announces Corporate Welfare for Monsanto (Extract)

In January 2004 Monsanto announced that it would abandon GM seed sales in Argentina because farmers were illegally saving patented seed, making it difficult for the company to collect royalties on proprietary seed.

Over the past decade, Argentina has been presented as the biotech industry's shining success story in the global South because Argentine farmers were early adopters of Monsanto's RoundupReady soybeans. Today, Argentina devotes more area to GM crops than any other country except the United States. Argentina is the world's third largest producer of soybeans, and Monsanto's GM seed technology accounted for an estimated 96% of the total soybean area planted in Argentina last year. (According to the Grupo de Reflexion Rural, Argentina certified soybean seed sellers in Argentina include Nidera (58%), Monsanto (19%), Don Maria (16%) and Relmo (3%), all of them license GM seed technology from Monsanto.) But now Monsanto complains that widespread "seed piracy" (seed saving) has pilfered the company's profits and soured the Argentine success story. One seed industry executive in Argentina warned that Monsanto's action was an important message for the entire seed sector: "This is the first warning sign that all new technologies will abandon us if intellectual property rights are not respected."

Gene Giants pampered on the Pampas

Argentina's government is offering to ease Monsanto's pain by creating a "royalties fund" to help Monsanto and other companies recoup investments in biotech crops that are threatened by black market sales. The Argentine government proposes to create a "global royalties" fund by levying a tax on soybean and wheat sales that will generate an estimated US$34 million annually. The Argentine Congress must first approve the proposal.

"It's a dream come true for Monsanto because the government of Argentina is enforcing monopoly patents by taxing seed sales, shifting all of the burden and expense to farmers and the public", says Silvia Ribeiro of ETC Group (see below). Civil society in Argentina is expressing outrage. In North America, Monsanto is vigorously prosecuting seed-saving farmers, but that approach is costly and the company is widely perceived as a corporate bully for suing its customers. To avoid messy lawsuits, high-priced lawyers and bad publicity, Monsanto and other Gene Giants hope to see the Argentine model adopted everywhere they do business. Says Hope Shand of ETC Group. "Patent monopolies are unnecessary if the State is willing to act as the gene police and collect royalties from farmers. The Argentine proposal is a dangerous precedent because the Gene Giants are pushing hard to open new markets - especially in the developing world. The Argentine model means that Monsanto could even sell GM seeds in countries that don't recognise patents or don't enforce them - as long as the government can be convinced to collect fees for Monsanto."

Source: Action Group on Erosion, Technology and Concentration (ETC), 26 February 2004, www.etc.group.org

GM soya causes problems

Seven years after GM soya was introduced to Argentina as an economic miracle for poor farmers, researchers claim it is causing an environmental crisis, damaging soil bacteria and allowing herbicide-resistant weeds to grow out of control. Soya has become the cash crop for half of Argentina's arable land, more than 11m hectares, mostly situated on fragile pamper lands on the vast plains. After Argentina's economic collapse, soya became a vital cash export providing cattle feed for Europe and elsewhere.

Now researchers fear that the heavy reliance on one crop may bring economic ruin. The GM Soya, grown and sold by Monsanto, is the company's great success story. Programmed to be resistant to RoundupReady, Monsanto's patented glyphosate herbicide, soya production increased by 75% over five years to 2002 and yields increased by 173%, raising £3bn profits for farmers hard-hit financially. However, a report in New Scientist magazine says that because of problems with the crops, farmers are now using twice as much herbicide as in conventional systems. Soya "volunteers" plants, from seed split during harvesting, appear in the wrong place and at the wrong time and need to be controlled with powerful herbicides since they are already resistant to glyphosate. The control of rogue soya has led to a number of disasters for neighbouring small farmers who have lost their own crops and livestock to the drift of herbicide spray. Soya was originally welcomed in Argentina partly because it helped to solve a problem of soil erosion on the pampas. Adolfo Boy, a member of the Grupo de Reflexion Rural, said the bacteria needed for breaking down vegetable matter so that the soil was fertilised were being wiped out by excessive use of RoundupReady. The soil was becoming so inert that dead weeds did not rot.

So keen have big farmers been to cash in on the soya bonanza that 150 000 small farmers have been driven off the land so that more soya can be grown. Production of many staples such as milk, rice, maize, potatoes and lentils has decreased.

Source: Guardian Newspaper, 15 April 2004

Greenpeace bars Argentine GMO soy from Brazil port

In March 2004 Greenpeace prevented a cargo ship carrying genetically modified Argentine soybeans from topping off its load in Paranagua, Brazil's main grain port, in the state of Parana. Parana, the country's largest producer of grain, banned GMO soybeans in October 2003. Although they are legally grown in nearly all states in Brazil, GMO soybeans are estimated to make up well under half of Brazil's crop. However, virtually all of the soybeans grown in Argentina are GMO.

Greenpeace said its members had blocked the ship, carrying 30,000 tonnes of Argentine soybeans, from entering the port of Paranagua, presumably to take on more soybeans from Brazil, a common practice called topping off. "The economic advantages of being the largest supplier of GMO-free soybeans in the world could be lost if there is no control to avoid contamination," Greenpeace said. The blockage is part of a Greenpeace campaign titled "A Better Brazil without GMOs."

Source: Reuters

Brazil

RR soybean push

Brazil is the world's second largest soybean producer and exporter. In 1998, Monsanto applied for approval of its RR soybeans. Approval was granted from the National Biosafety Committee (CNTBio) that same year. In response, Greenpeace and the Institute for Consumer Protection (IDEC) went to court to challenge the legal authority of the CTNBio. The courts decided in favour of Greenpeace and IDEC, finding that, according to the Law of Biosecurity, the Ministries of Health, the Environment and Agriculture are responsible for approving RoundupReady soybeans not the CTNBio. The courts ruled that the cultivation of GE crops be suspended until an environmental impact study is conducted. Neither Monsanto nor the ruling governments have carried out such a study. Monsanto has continued to pursue approval.

Monsanto's strategy

Monsanto established a $530 chemical plant in Sao Paulo that produces components for the Roundup herbicide. The then government provided a low-interest loan of $250 million to Monsanto for the construction of the plant. The establishment of the plant was part of Monsanto's strategy to realign some of its international agrochemical and seed production to Brazil. Monsanto also launched an extensive public relations campaign, holding seminars for media, and others who might "form public opinion", as well as lobbied government representatives.

In September 2003, the Vice President of Brazil, Jose Alencar (of the new government under Luis Inacio Lula da Silva, leader of the labour party), signed a decree to allow certain farmers – those who have already been growing smuggled RR soybean seed – to plant RR soybeans for one growing season. Farmers who plant the seeds must sign an agreement with the government saying they will take financial responsibility for any environmental damage that results from planting GE soy. As well, farmers are not allowed to sell seed saved from RR crops. (According to a June 2003 article by Via Campesina in the weekly newspaper *Brasil de Fato*, the GE soy will be commercialised until January 31, 2004 after which time the entire stock will be conventional.)

Protest against Monsanto

In June 2003 members of the landless workers movement in Brazil (MST) invaded a farm owned by Monsanto in the central state of Goias. It was the third protest of this kind against Monsanto property in 2003, and the company has urged the government to take back the land, warning that repeated invasions "damage the image of the country". The MST says the centre is being used to grow and stockpile seeds, ready to flood the market if GE is legalised in Brazil. Monsanto claims that these kind of invasions compromise scientific 'progress' in Brazil. MST stated the objective of the occupation was "to expel" Monsanto from the state and convert the 43 hectares (106 acre) farm to organic production.

The decree signed by Alencar in September 2003, sparked strong responses. Attorney General Claudio Fontelles filed a request asking the Supreme Court to overrule the decree, claiming that the planting of RR soybeans without an environmental impact study is unconstitutional. The National Farm Workers Confederation filed a similar suit using the same argument.

Source: Monsanto – The GeneGiant, RFSTE/Navdanya/Polaris Institute

Smuggled seed

Large numbers of small farmers in Rio Grande do Sul in southern Brazil have been growing RR soybeans from smuggled seed, believed to have come from Argentina and Paraguay. Estimates of how much of Brazil's soybean crops are planted with RR seed vary from 10% to 30%. In Rio Grande do Sul the estimate is as high as 70%. While the new decree lets farmers grow RR soybeans legally, some pro-biotech groups, like the American Soybean Association, have complained that Brazilian growers have not been paying for patented seed technology, and that has given them a 'competitive advantage' over US farmers. At the same time, Monsanto has begun to implement a royalty collection system, in which the corporation can collect royalties from local exporters for RR soybeans now that the seed is legalised.

Porto Alegre, 11 March 2004:

Monsanto and Agriculture Federation of Rio Grande do Sul found guilty

The International People's Court on Transgenic Products was organised by approximately 40 groups such as trade unions, NGOs, and environmental institutions. The court discussed the accusation that transgenic seeds are being illegally introduced into Brazilian crops and the consumer market. Around 3,000 people attended the event.

The verdict:

The court finds Monsanto and the Agriculture Federation of the State of Rio Grande do Sul guilty for the illegal spread of transgenic soya seeds throughout Rio Grande do Sul.

The sentence:

- The jury has unanimously decided that there is not enough scientific evidence to show that transgenic products will not harm the environment, biodiversity and human health. It has also unanimously decided that not enough information is available about this issue for farmers and consumers, and that the process of analysis, evaluation and monitoring of the tests for the commercial release of GM technology is not being carried out with enough care and democracy.
- As for the defendants, the Monsanto Corporation and the Agriculture Federation of the State of Rio Grande do Sul, the jury unanimously found that they are guilty of the illegal distribution of transgenic seeds, putting the environment, biodiversity, the health of the population, the genetic heritage of the species and the Brazilian economy at risk.
- On the other hand, the jurors considered that governmental state agencies are also guilty of such practices.

With the verdict from the Jury, the Court reached at the following conclusions:

- There are not enough studies on the introduction of genetically modified organisms into agriculture and the consumer market; thus, independent studies must be carried out in order to ensure the safety of such products.

- The defendants, Monsanto Corporation and the Agriculture Federation of the State of Rio Grande do Sul, in collusion with governmental state agencies, have contributed to the illegal distribution of transgenic seeds in Brazil, which may be considered a crime of smuggling (according to article 334 of the Brazilian Penal Code) and a crime of illegal distribution of genetically modified organisms (according to article 13, section V, of the Brazilian Law 8.974/95.)
- It is necessary that the National Congress holds public consultations on the issue so that the new Brazilian Biosafety Law, going through the Senate, takes social, environmental and scientific aspects into consideration. Furthermore, it is necessary that such a law adopts the Precautionary Principle, ensuring that studies on the environmental impact will be carried out before the release of transgenic organisms for both commercial and scientific purposes.

Based on such conclusions, the Court also determines that the following measures be taken:

- Question Monsanto Corporation to find out which genetic modifications it introduced into seeds sold in Argentina from 1995 to 2004, particularly which species of genes it introduced into the modified seeds.
- Require the Prosecuting Council to hold an inquest to verify the practices of smuggling and the illegal distribution of genetically modified organisms by the defendants.
- Require environmental inspection agencies to put effective policies into practice in order to reverse the spread of transgenic seeds in Brazil, which happened in total defiance of the law that is now in force, and to ensure that the law related to labelling products of transgenic origin be followed.

Source: Friends of the Earth International, April 2004

Mexico

Mexico commercially grows a certain amount of GM cotton and soybean, however growing of GM corn is banned. But, in spite of the ban, GE corn from the U.S. has contaminated native varieties. Mexico is the world's primary centre of corn genetic diversity. Corn, in the form of tortillas and other maize dishes is the Mexican staple food. Until the 1960s, Mexico was self-sufficient in maize. Since some years, large amounts of US corn are imported with market prizes being cheaper than local maize. This is because of the U.S. agricultural policy, which heavily subsidises American farmers, such underselling Mexican peasants. The fear of small farmers regarding GE corn - and loosing their livelihood - mounts.

The big GM corn risk

American GE corn has made its way into Mexican fields and could ultimately displace native corn varieties unless the government moves to protect them, a multinational panel of researchers warned. So little is known about the potential effect of altered corn in Mexico -where maize was first domesticated 9,000 years ago - that risks to the country's 60 corn varieties and the larger ecosystem are unpredictable, said the panel, convened by the Commission for Environmental Cooperation set up under the North American Free Trade Agreement (NAFTA).

"One thing is clear," the study's coordinator, Chantal Line Carpentier said, "the huge diversity in Mexico should be protected in situ and in gene banks." Much of the concern is that contamination of native varieties would limit future possibilities of developing improved crop lines from corn that is now free of genetic modification. The commission will present a final report and recommendations to the American, Mexican and Canadian governments in June 2004.

Although Mexico imposed a ban on planting genetically engineered corn in 1998, scientists detected insect-resistant corn in Oaxaca fields in 2001. The researchers' draft report suggests that the modified corn got into fields when farmers planted corn imported from the United States. Mexico imports five million metric tons from the United States — mostly for animal feed — of which about 30 percent is modified grain but is not separated or labelled.

There is still no conclusive study on how widely genetically modified corn has spread in Mexico, said Amanda Galvez Mariscal, a professor of food sciences and biotechnology at the National Autonomous University of Mexico. Existing modified corn strains, designed for American farmers, are of little use to Mexican farmers, a fact that helps to limit their spread right now. But a future strain that increases Mexican yields might be widely adopted, despite the planting ban, and overwhelm native varieties, Ms. Carpentier said. The report will probably call for some effort to educate farmers to stop planting seeds imported from the United States and a vast program to track modified corn.

"As long as we don't have regulations, we need to have monitoring that will give you an early warning of the presence of transgenic material," said Jose Sarukhan, a professor at the Institute of Ecology at the National Autonomous University of Mexico and an adviser to the NAFTA commission.

Source: The New York Times; http://www.nytimes.co

Save Mayan Corn

The Zapatista Education System created "Mother Seeds in Resistance from the Lands of Chiapas" because of the infection of indigenous maize caused by GM corn in southern Mexico. Students are meeting with traditional farmers in order to collect and preserve "mother" seed. This seed is held in trust for the good of all the indigenous communities of Chiapas. Students in the Zapatista Education System are also researching and recording a vast amount of agricultural and cultural information associated with their corn.

Schoolsforchiapas@schoolsforchiapas.org

For summer 2004, the movement plans to carry out over 1000 tests on corn seed from various communities in Chiapas to see whether any GMO contamination has taken place. Farmers also hope to sell - nationally and internationally - many of the corn seed packages prepared by them to people who will plant this pure seeds in their community, their farm, their home or school gardens. Creating such "corn sanctuaries" will help to preserve the precious Mayan corn heritage.

Source: Ascribe-Public interest newswire, 28 April 2004

North America

Canada

Canada grows GM soybeans, corn and canola. With 6% of the global GM crop production, it is the number three after the U.S and Argentina. Monsanto is also aggressively active in Canada, and as the by now world famous Percy Schmeiser case (see the following as well as the Legal Framework for Biosafety and GMOs, page xy) shows it also bullies farmers who do not grow its crops (and, sometimes still gets away with it). Canada has not signed the Biosafety Protocol, and acts as an U.S. ally regarding the "European moratorium".

Canadian crops have less and less acceptance in the world market. Countries who want to protect themselves from GMOs do not buy canola, maize or soybeans – also non-GM ones - from Canada for fear of contamination. In the last years Canada has lost all its oilseed rape (canola) market to Europe, with an estimated 300 million dollars. More and more Canadian farmers, environmentalists, consumers and exporters protest against GM crops and food and demand withdrawals of GM crop projects and mandatory labelling for GM products. They also ask for Canada signing the Biosafety Protocol.

The case of Percy Schmeiser

1998, Monsanto filed a lawsuit against Saskatchewan farmer Percy Schmeiser, alleging that he *grew RR canola without a license.* Monsanto wanted Schmeiser to pay the corporation the same fee required of those growing GE crops under contract. Schmeiser refused, saying that his crops must have become contaminated from GE canola grown nearby. In September 2002, the Federal Court ruled that Schmeiser did violate Monsanto's patent on its GE canola seeds. Schmeiser fought the court's ruling. In **May 2003,** Schmeiser and his lawyers were granted the right to appeal and were allowed to take their appeal to the Supreme Court. Schmeiser insists he never deliberately planted Monsanto seeds and says that seeds can fly for miles, as far as from North Dakota to northern Saskatchewan. The Federal Court did not disagree that the Monsanto's seeds may have blown onto Schmeiser's property, but said it was Schmeiser's obligation to destroy the seeds. Mr Schmeiser's lawyers will argue in the Supreme Court that companies have no right to patent an entire plant. A coalition of non-governmental organisations, led by the Council of Canadians, and including the Sierra Club of Canada, Canada's National Farmers' Union, the Action Group on Erosion, Technology and Concentration, the International Center for Technology Assessment (Washington, DC) and the Research Foundation for Science, Technology and Ecology (New Delhi, India) applied to intervene in Schmeiser's case.

Source: Polaris Institute, Canada, and Research Foundation for Science, Technology and Ecology, India

On 22 May 2004 the Supreme Court took its decision: Against Percy Schmeiser, and in favour of Monsanto (see the Legal Framework for Biosafety and GMOs, p. 87).

Problems brought about by GM crops

Listed by the National Farmers Union

Increased Disease/Weed/Contamination Problems

There is growing evidence that glyphosate, he active ingredient in Roundup, contributes to the spread of fusarium in grain crops. A University of Manitoba study found that 95% of non-GM certified canola seed lots are contaminated by GM material. In March 2004, Monsanto was asked to increase its buffer zones for open-air field tests of GM wheat to 300 meter from 30 meter after studies found GM wheat pollen travelled beyond 30 m. For the past three years Monsanto has tested GM wheat in open-air fields with 30 m buffer zones.

Superweeds, resistant to glyphosate are becoming more common, leading to increased herbicide use. Once a crop is released it cannot be unreleased. The widespread genetic contamination of canola in western Canada means that Canada will never be able to grow-non-GM canola from Canadian canola seed and canola export markets are lost forever. We do not have systems in place to prevent genetic contamination through pollen flow, spills or human error.

The use of GM technology is not allowed on certified organic farms. Organic crops contaminated by neighbouring GM crops cannot be sold as organic, leading to a loss of a premium price for the crop. Wind pollinated GM crops like canola, corn and wheat are a major concern for organic farmers.

Increased corporate control

Between 1974 and 2000 gross farm income tripled but net farm income fell. Input suppliers, including suppliers of GM technology have captured 100% of the increase in gross income. GMOs burden farmers with higher seed costs, increased chemical costs and a loss of markets.

Farmers growing GM crops are required to sign Technology Use Agreements (TUAs) through which they agree to not save any of their crop for seed and to allow company inspectors on their farm for several years. TUAs cost farmers money and give corporations additional control over family farms.

The Percy Schmeiser case highlights two issues: 1) farmers' rights to retain and use farmer-saved seed and 2) the ability of a corporation to punish any farmer who has had their seed supply contaminated.

The biotech industry maintains that foreign markets should be forced to be more accepting of GM wheat. If consumers in places like Europe and Japan refuse to buy GM foods, forcing trade agreements down their throats will not open up markets.

National Farmers Union, Region 3 Ontario

Citizens struggles and victories:

Organic farmers launch lawsuit against Monsanto and Bayer

The Saskatchewan Organic Directorate (SOD), through its Organic Agriculture Protection Fund, has launched a class action lawsuit against Monsanto and Bayer Crop Science on behalf of over 1,000 of the province's organic canola farmers. The lawsuit is being filed because Monsanto and Bayer CropScience's GE canola has polluted organic farmers' fields. As a result of the pollution it is impossible for the farmers to grow certified organic canola. The preliminary economic analysis by SOD shows that losses caused by the introduction of GE canola could be well over $14 million. The farmers are seeking compensation from the two corporations.

Source: Monsanto -The GeneGiant, RFSTE/Navdanya/Polaris Institute

Canada applauds Monsanto's Suspension of Biotech Wheat Program

In May 2004 Monsanto suspended plans to introduce what was supposed to be the world's first biotech wheat. Apart from GMO opponents, farmers unions and public in general, Canada's wheat exporters were pleased about Monsanto's decision. The Canadian Wheat Board has a monopoly on exports from Canada's main wheat-growing regions. Such it did not want its market to be endangered by GM wheat and lobbied against Monsanto's GM wheat. Already in 2003 a majority of Canada's wheat buyers demanded guarantees that the wheat they bought was GM-free. Monsanto's decision to withdraw biotech wheat came as the Canadian anti-GM-wheat campaign (and the No-to-GM-bread worldwide) was gaining momentum.

Quebec: Mandatory labelling of GMOs wanted

On behalf of Greenpeace, Option Consommateurs and l'Union des Consommateurs Léger Marketing undertook a survey on food labelling. The results of the survey show that 83% of Canadians and 91% of Quebeckers want the federal government to impose mandatory labelling of GMOs. The survey also shows that 87% of Quebeckers want the Quebec government to impose their own mandatory labelling, if the federal government continues to ignore consumer demands. This is the first such survey since the adoption of a voluntary labelling standard, which allows for a 5% allowance of GMOs in food without the need for that food to be labelled. The Canadian voluntary standard does also not contain a system of traceability of GMOs. The Option Consommateurs said it was looking for a mandatory labelling standard which would allow much less than 5%.

Shoppers Guide

Greenpeace Canada informs consumers which products in Canadian grocery stores contain GM ingredients. It also lobbies the big grocery chains to inform customers about the contents of their products. Greenpeace Canada's genetic engineering campaign also focuses on manufacturers who use GM ingredients in their products.

USA

The U.S. is the biggest producer of GM crops, amounting for nearly 70% of the worldwide GM crops, planting large-scale canola, maize, soybean and cotton. Monsanto, the biggest of the GeneGiants has its headquarter in the U.S. and aggressively pushes GM crops the world over and pushes farmers around. The US Administration supports this aggressive company behaviour. The U.S., assisted by number two and three in GM production, Argentina and Canada, has filed a suit at the WTO against the European Communities "GM moratorium" (see also the Legal Framework for Biosafety and GMOs). The U.S. has not signed the Biosafety Protocol.

The intensive GM crop production takes a heavy toll on public and state spending and income: GM crops have cost the United States an estimated $ 12 billion in farm subsidies, lost sales and product recalls due to transgenic contamination. The maize exports from the U.S. to Europe has declined from 3,3 million tons in 1995 to just 25 000 tons in 2002 due to fear of GMOs. The US has also lost substantial markets in other countries such as Japan and South Korea due to the same fear. GM crops also take a heavy toll on the environment: Multiple herbicide-tolerant volunteers and weeds have emerged in the United State. Glyphosate-tolerant weeds are plaguing GM cotton and soya fields, and atrazine, one of the most toxic herbicides has had to be used with glufosinate-tolerant GM maize (see also pages xy by the Independent Science Panel).

But also giants lose out. An example is the Monsanto GM wheat. The global public outcry on the eve of the launch of Monsanto's GM wheat forced the company to halt the project.

And last but not least, the U.S. also knows large-scale public protest against GMOs. And an increasing number of citizens opt for sustainable agriculture and the right to choose their own food.

Monsanto fleeces US farmers

Monsanto took Tennessee farmer Kem Ralph to court for saving Bollgard cotton and RoundupReady soybean seed. The farmer was sentenced to 8 months in prison. Homan McFarling was fined for growing RR soybeans without paying Monsanto's license fee. That's just two examples out of a long list. Monsanto has filed over 475 lawsuits against farmers for patent infringement and violations of its technology user agreement. When farmers in North America grow Monsanto's GE seeds they must pay licensing fees and sign technology user agreements that block them from saving seed and make it mandatory to buy Monsanto's chemicals. If farmers are found breaking these contracts or growing Monsanto's GE seeds without paying licensing fee, they are penalised.

Control mechanism or cronyism?

With the FDA (Food and Drug Administration) approving of GMO products, one would like to think that a government regulatory agency can be trusted. But take a closer look at who is sitting pretty: Prior to being the Supreme Court Judge who put G.W. Bush in office, Clarence Thomas was Monsanto's lawyer. The US Secretary of Agriculture, Anne Veneman, was on the Board of Directors of Monsanto's Calgene Corporation. In order for the FDA to determine if Monsanto's growth hormones were safe or not, Monsanto was required to submit a scientific report on that topic. One of Monsanto's researchers put the report together. Shortly before the report submission, the researcher left Monsanto and was hired by the FDA. Her first job for the FDA was to determine whether or not to approve the report she wrote for Monsanto. In short, Monsanto approved its own report. Deciding whether or not rBGH-derived milk should be labelled fell under the jurisdiction of another FDA official, Michael Taylor, who previously worked as a lawyer for Monsanto. So how are GMO products controlled?

GMOs - Failures, Threats and Alternatives

By Brian Tokar*

The failure of GMOs in the US

1. *Specific incidents of failure*

Cotton growers in Mississippi and other southern states found that Bt cotton had misshapen bolls, which fell off the plants before reaching full maturity. There were several lawsuits and arbitration proceedings around this in the late 1990s.

Soybean farmers in the lower Midwest found that Roundup tolerant soybean plants had brittle stems, which cracked and fell over under hot, dry conditions. The plants were found to have more than the usual amount of lignin in their stems, a trait which is physiologically unrelated to Roundup tolerance (hence an example of the inherent uncertainty and instability of GMOs).

Bt cotton doesn't fend off insect pests unless farmers continue to use large quantities of toxic insecticides; those who have tried to rely on the Bt trait for pest control have faced serious pest infestations.

2. *Inconsistent yields*

Studies by several midwestern universities have shown that yields from GE crops vary widely, in comparison to conventional crops. In some small geographic areas, the yields are higher, in most they are significantly lower, usually within a margin of 10-15% compared to conventional varieties, but sometimes varying by much more than that.

3. *Increased pesticide use*

Agronomist Charles Benbrook has done several detailed studies of pesticide use (herbicides and insecticides) by growers of GE crops. He has found that pesticide use was slightly lower in the first few years of GE use, but is now significantly higher; total pesticide use has increased by an estimated 70 million pounds since 1996, mainly due

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to the use of herbicide tolerant crops. He has also found that GE crop production is significantly costlier to farmers than non-GE production (see www.biotech-info.net for these studies).

Many farmers report anecdotally that their neighbours who grow GE varieties have seen consistently diminishing returns the longer they use GMOs.

Numerous weed species in the US have evolved resistance to Roundup-family herbicides, necessitating ever-increasing applications of Roundup, usually in combination with other even more toxic herbicides.

Farmers cannot rely solely on Roundup or Bt; these are universally used in combination with other toxic chemicals.

The Bt toxin in GE plants is in a highly activated form, at concentrations 5 – 20 times that found in the native Bt bacteria. This increases the threat to beneficial organisms in the environment. Transgenic Bt also persists in soil for at least seven months.

Examples of contamination / genetic pollution

There is very little monitoring of contamination in the U.S., with over 100 million acres of GMOs being grown in this country.

One small study, undertaken by the Vermont Public Interest Research Group, looked for traces of transgenic proteins in corn samples from 12 farms around the state. Each of the farmers volunteered to have their crops tested. One sample of organic corn—the one grown in closest geographic proximity to several large-scale 'conventional' dairy farms—showed significant contamination, testing positive for the Bt toxin protein Cry1AB.

The Union of Concerned Scientists recently tested samples of popular (non-GMO) corn and soybean seed varieties from various midwestern suppliers, and found significant transgenic contamination in 2/3 of the samples they tested.

In Canada, there have been persistent reports of multi-resistant canola appearing in farmers' fields. This can only be due to the cross-pollination of several GE herbicide tolerant varieties. Some samples are resistant to 3 different classes of herbicides.

Regulatory systems for dealing with contamination, including liability and GMO free zones

The US regulatory system is completely inadequate for addressing GMO pollution. The USDA simply approves company field trials with 30 days' notification, unless the transgenic trait under consideration has one of several unique qualities (pharmaceutical or other chemical-producing crops, experiments with noxious weeds, and animal or human pathogens), in which case there is a 4 month permit process. There have been nearly 9000 GMO field trials in the US. Following field trials, the developer applies for deregulation, i.e., for the variety to simply be removed from USDA oversight. There is no actual "approval" process. Out of 87 petitions as of October 2003, 57 GMO varieties have been deregulated by the USDA, allowing unregulated commercial use of these varieties.

Pollution, Patents and Threat to farmers rights

Monsanto has an entire department, with 75 staff and an annual budget of $10 million, devoted to suing and harassing farmers. Hope Shand from ETC Group reports that there have been 475 suits against farmers to date.

Ecological alternatives and strategies for freedom from GMOs, such as GMO free zones

Communities throughout the U.S. have responded to our government's unwillingness to address this issue by enacting regulations at the state and local levels:

79 Vermont towns, 11 in Massachusetts and 1 in New Hampshire (all in New England) have passed resolutions at their annual Town Meetings against GMOs, most calling for both labelling of GE foods and a moratorium on GE crops. Some also have addressed the farmer liability issue. Over 20 of the towns in Vermont passed language calling for a moratorium on the planting of GE crops in their town.

Mendocino County (see also below) in northern California has voted in favour of a complete ban on the use of genetically engineered plants or animals in the county; several neighbouring counties are considering following suit.

Maryland has banned the release of GE fish into state waterways.

Maine's Pesticide Control Board refused to approve the use of Bt corn in the state. Maine also requires GE manufacturers and seed dealers to provide written instructions on how to minimise contamination of non-GE crops, and to maintain a list of all growers of GE plants in the state.

North Dakota limits the rights of companies with GE patents to collect samples from farmers without first asking for their permission, and also requires seed manufacturers and producers to resolve any disagreements through mediation or arbitration.

Both houses of the Vermont state legislature have passed a bill requiring registration and labelling of GE seeds sold in the state (hopefully this will soon be signed into law by the Governor), and the Vermont Senate (upper legislative chamber) has passed a bill making GMO manufacturers fully liable in cases of contamination.

GM free zones

On 2nd March 2004 voters in Mendocino County, California banned the production of GE crops and animals. Mendocino is the first county in the U.S to implement such a ban. The biotech lobby will probably try to introduce a bill in California to nullify the Mendocino GE ban and make it illegal for other California counties to pass similar laws. WTO bureaucrats and the White House have also made it clear in the past that local citizens' control over unpopular technologies such as genetic engineering will not be tolerated.

However, a campaign called the Biodemocracy Alliance wants to spread GE-Free zones across at least a dozen of California's 59 counties, as well as counties all over the U.S.

The global GMO antidote

The Biosafety Protocol

(See also Legal Framework for Biosafety and GMOs, p. 83.)

Important points of the Biosafety Protocol:

- **The Protocol seeks to protect biological diversity from potential risks that may be posed by living modified organisms resulting from modern biotechnology.**
- **It establishes an advance informed agreement procedure for ensuring that countries are provided with prior written notification and information necessary to make informed decisions regarding GMOs.**
- **A country has the right to restrict or ban the import and the use of GMOs.**

As of 10th May 2004, 97 instruments of ratification or accession have been deposited with the UN Secretary-General to the Convention on Biological Diversity:

List of countries see the Legal Framework for Biosafety and GMOs, page 95
http://www.biodiv.org/biosafety

Big but not beautiful

USA, Argentina and Canada, the three biggest GM producers worldwide, have not signed the Protocol. Instead they have filed a dispute at the WTO against the European Union's policies on GM Foods.

When Northern Elephants Fight Over GMOs

By Tewolde Berhan Gebre Egziabher*

As the world's attention was focused firmly on the Cancun World Trade Organisation summit in September 2003, an important international agreement quietly made its entry on the world stage, holding out immense implications for developing countries.

The Cartagena Protocol on Biosafety, which aims to regulate trade in genetically modified organisms (GMOs), came into force on 11 September after five-year-long negotiations over trade advantages and disadvantages—intractable North-South issues that are set to continue to bedevil the Protocol's implementation. This is highlighted most forcefully by the US move to take the European Union to the WTO dispute settlement mechanism over the EU's insistence that US exporters clearly label all GM food sold to Europe.

One of its main complaints is that Europe's stand makes Africa reject GM. The elephants that are Europe and the US thus fight, and the grass that is Africa gets trampled. The WTO Ministerial Meeting in Cancun, Mexico, which would have had direct or indirect implications on the case, collapsed on September 14, 2003, largely because the South, and especially Africa, refused to accommodate the elephants. Is this a foretaste of the implementation of the Biosafety Protocol as well? Why do I foresee future difficulties? The reasons are many.

The US, which is unlikely to be a party to the Protocol, and the parties to the Protocol start from opposing premises. The US starts from the premise of "Substantial Equivalence," which says GM crops is as safe as non-GM ones unless proved otherwise. The EU and the developing world support the "Precautionary Principle" embodied in the Protocol, which states that a GM crop is to be considered possibly risky unless proved to be safe. From these perceived differences flow implications for implementation.

The Cartagena Protocol requires a country to allow the importation of a GMO only after it has obtained all the necessary information about it and carried out a risk assessment to evaluate the likelihood of harm to human health, to agricultural systems, to its environment and to its socio-economic conditions. The country of import is first informed by the exporter or by the country of export of the intention to export the GMO. The country of import, after a risk assessment, then informs the exporter or the country of export in writing whether or not it will allow the import.

In the case of GM commodities intended for food, feed or for processing, the intention to export is notified to all countries in one go through a computerised database system called the clearinghouse. In this procedure, failure to communicate a decision to the country of export or to the clearinghouse cannot be taken as an agreement to import. The failure might happen through lack of capacity and the Precautionary Principle would then imply that no exportation takes place.

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* Dr. Tewolde Berhan Gebre Egziabher, Director General of Ethiopia's Environmental Protection Authority, was chief African negotiator at the Cartagena Protocol.

There are some exceptions to the procedure. A GMO that is merely transiting through a country is not subject to the procedure. However, if a country considers any GMO too dangerous to be allowed even transit, it has the right to register this fact at the clearinghouse and prohibit its transiting.

A GMO that is destined for contained use—under conditions from which it cannot escape into the open environment and cannot come into contact with humans or other forms of life—need not go through the procedure before importation. A GMO for use as a pharmaceutical for humans is subject to the procedure unless there is another international law or a specified international organisation to govern its import and export authorisation. At the moment, there is no international law other than the Cartagena Protocol to govern the environmental impacts of GMOs. The World Health Organisation is responsible only for the safety to human health of pharmaceuticals—GMOs or otherwise—and not for their environmental impact.

When it comes to implementing and regulating the Protocol, however, developing nations are faced with all kinds of handicaps for a variety of reasons. For instance, the Protocol depends on full information for its effective implementation–it requires a labelling and traceability regime to be negotiated once it comes into force. But the US, the biggest producer of GMOs in the world, refuses to label them, so countries will not necessarily know when an unlabelled US GMO is imported into their territories. In the meantime, safety will be compromised.

Should a risk occur, poor developing countries would find it hard to muster the financial and technical capacity needed to combat it? One would have thought that, given this situation, socio-economic considerations would constitute a very important component in decisions over whether to import a GMO. But the relevant provision of the Protocol is very weak. However, neither this weakness nor any other international law prevents a poor country from adhering to the Precautionary Principle and making a rigorous socio-economic assessment before importing a GMO. Risk assessment in the South also becomes complicated because of the complex tropical and subtropical environments. A micro-organism under contained use functions optimally at high temperatures. If it escapes into the open environment in the North, it is unlikely to survive the winter cold. But in the hot tropical and subtropical environments of the South, it may survive and flourish indefinitely. The South should, therefore, put in place biosafety systems that restrict contained use only to laboratory conditions from which the escape of GMOs is impossible.

Another major problem is related to the rich biodiversity of the South. Biodiversity increases towards the Equator and decreases towards the poles. The environmental risk GMOs pose is one of passing their genes to wild species. The larger the biodiversity, the more complex and uncertain becomes the evaluation of risks posed by GMOs. And yet, owing to low technical capacity, specific knowledge on the South's biodiversity is very poor. Additionally, most centres of origin of crops are in the South, which makes any mistaken release of a GM crop more devastating in the South.

The Protocol's information and risk assessment requirements recognise this fact and include centres of origin and genetic diversity. It should thus be, but is not necessarily seen as, in the interests of the North not to push GM crops into the South, and for the South to resort to caution. After all, virtually all crops of importance in the North have their centres of origin or genetic diversity in the South, which means that the North depends on the South for its future breeding programs and its future food security.

A more intractable issue, of course, is trade and environment. Trade rules favour the North. And the international agreement on Trade-related Aspects of Intellectual Property Rights (TRIPs) makes GMOs especially problematic for the South. TRIPs make the patenting of micro-organisms and micro-biological processes compulsory. The North is allowing the patenting of GMOs and their sub-cellular components based on this provision. The cellular parts essential for genetic engineering are already patented. This means that any domestic development and use of GMOs will become internationally bureaucratic (negotiating for the tens of sub-cellular parts) and expensive (paying royalties on each patent). It also means that GMOs, even when developed in the South, will be controlled by the foreign owners of patents on sub-cellular parts. TRIPs put the burden of proof of innocence on the person accused of the infringement of a process patent. This could spell trouble when a GMO cross-pollinates with the unmodified crop of a smallholder farmer and his crop becomes contaminated by patented genes.

Absurdly, the farmer is assumed to be a process patent infringer. The culprits—the wind and the insects–cannot be summoned to court as witnesses. A South that wants food sovereignty and its farmers to remain innocent of crime can refuse the planting of genetically modified crops in its territories.

Happily, however, at the insistence of the South, there is now a commitment to negotiate a liability and redress regime under the Protocol in case of damages caused by GMOs. Given these handicaps, is the South going to benefit from genetic engineering? I wonder.

Generally, genetic engineering appeals to the South, which wants to develop fast; the technology promises to put beneficial traits found in living organisms to human use. Conversely, not using this capacity threatens being left even farther behind in development.

The South has no choice but to stay safe. It has to put in place biosafety systems firmly based on the Precautionary Principle and develop the capacity—no matter how expensive—to protect itself.

Global campaigns

Various global campaigns led by international organisations fight GMOs, point out alternatives and promote organic crops and food. Here a selection of globally active anti-GMO campaigns:

The Global Citizens' GMO Challenge

(Text see p. 77)

The Global Citizens' GMO Challenge is a means to fight GMOs, to stand up for sane and sustainable alternatives in agriculture, to insist on the right of all citizens to choose safe food and to urge their governments to protect their people and their environment from GMOs. For Sign-up sheet email: gmochallenge@yahoo.com

For more information: *www.vshiva.net*

Greenpeace

Greenpeace Genetic Engineering Campaign: A global campaign for a global issue. Apart from non-violent creative protest actions against GMOs, Greenpeace gives down to earth advice to consumers on how to avoid GE food. Greenpeace consumer guides or lists are being released in more than 20 countries. GP works with food producers and retailers who are committing themselves to use non-GE ingredients, others that continue to use GE ingredients will be "named and shamed". In Europe operation Trolley Watch is going to be launched to use the new European Label Laws to say no to GE food.

http://weblog.greenpeace.org/ge/archives/001213

Friends of the Earth International

Friends of the Earth have 68 members groups around the globe. Its members are actively involved in the fight against GMOs, in supporting countries to ban or restrict the introduction of GMOs and to support sustainable agricultural practices and food. Friends of the Earth, supported by more than 200 organisations, have initiated a Citizens' Objection campaign under the title **Bite Back: WTO Hands off our food!**

http://www.foei.org/gmo/

The alternative to GM crops dominated agriculture is organic agriculture:

International Federation of Organic Agriculture Movements (IFOAM)

IFOAM works worldwide in promoting organic agriculture. Its mission is to lead, unite and assist the organic movement in its full diversity. IFOAM's goal is the worldwide adoption of ecologically, socially and economically sound systems that are based on the principles of Organic Agriculture.

www.ifoam.org/index.htm

The organisations that put together and supported this Report are:

The Research Foundation for Science, Technology and Ecology (RFSTE)

RFSTE was founded in Dehra Dun, India, in 1982 by Dr. Vandana Shiva. It works on biodiversity conservation and protecting people's rights from threats to their livelihoods and environment by centralised systems of monoculture in forestry and agriculture.

E-mail: rfste@vsnl.com; *Website: www.vshiva.net*

Navdanya

Navdanya is an Indian national network of grass roots conservation efforts to protect biodiversity. It started in 1987 as a programme initiated by RFSTE. Navdanya means nine seeds and these represent India's collective sources of food security. Navdanya works with and supports local communities involved in organic farming and seed saving. Navdanya informs policy makers as well as the public about the dangers of monoculture, agrochemicals and genetic engineering and runs various campaigns regarding such issues.

E-mail and Website see RFSTE

The International Commission on the Future of Food and Agriculture

Launched as a joint initiative of the President of the Region of Tuscany, Italy, and the RFSTE, India, the Commissions members are farmers, scientists, politicians and authors from across the world promoting sustainable agriculture, food sovereignty and biodiversity.

Contact RFSTE for more information

Global Citizen's GMO Challenge

On May 13, 2003 the US, joined by Canada and Argentina, filed a dispute in the WTO against the European Union's policies on Genetically Modified (GM) Foods. The EU has a strict policy on GM foods, requiring labeling and enacted a five-year moratorium on GM food until further research has been done. The US regarded this moratorium as a "trade barrier" and on 18th August requested the WTO to establish a panel with the intention to lift the moratorium. This WTO panel will be deciding on this case in the near future, and the outcome will affect the right of people everywhere to choose safe food.

YOU CAN HELP

- To keep our food system and ecosystem GM Free
- To defend our freedom to choose safe food

How?

- Join us by signing the Citizen's GMO Challenge
- Simply sign your name on the sign-up sheet or send your contact details (name, address or email) to **gmochallenge@yahoo.com** or the address below *(please specify if you are signing as an organization or individual, or both)*
- Spread the word! Collect more signatures and send to the email above OR at the address given below:

NAVDANYA
A-60 Hauz Khas, New Delhi, India – 110016
Tel: 0091-11-26561868, 26969077, Fax: 0091-11-26562093
Email: rfste@vsnl.com, vshiva@vsnl.com
For more information email gmochallenge@yahoo.com
or see our website www.vshiva.net

Global Citizen's GMO Challenge

1. Citizen's Around the World Say NO

At the 7th annual Biodevastation conference, a broad grassroots gathering of concerned citizens from around the world, it was decided to mobilize a people's intervention into the US-EU dispute over Genetically Modified (GM) Foods.

Seven years after the first commercial introduction of genetically modified (GM) foods, most people around the world still firmly reject this technology. Only four countries are growing nearly all of the world's genetically modified crops, with the US alone accounting for over 75%. More than 35 countries around the world, including the entire European Union, have taken steps to restrict the growing and importation of GM crops, and require labeling of all foods with genetically modified ingredients.

The U.S. administration response has been to bring a suit at the level of the World Trade Organization (WTO) to pressure the European Union to lift its five-year de facto moratorium on new GM food varieties and strict limits on imports of GM products. Once again, US-based agribusiness companies, the biotechnology industry, and their political allies in Washington are seeking to force this hazardous technology on the peoples of the world.

2. Citizen's Have Standing

We assert the right and duty of citizens to participate in the setting of international rules and regulations regarding trade. The WTO claims to be a multilateral institution, where each country (and by extension, each citizen) has an equal vote. However in practice, the WTO is a "multinational" institution, where multinational corporate interests use governments as proxy to push their interests unilaterally.

The people of the United States are not demanding an end to the EU moratorium, they are demanding clear labeling of GM foods. In many states Americans are demanding a moratorium of their own. The US trade representative is representing a handful of biotech corporations, not US citizens, in demanding that the EU change its policies against the will of its own citizens.

This case is not just an assault on the rights of EU citizens to make their own food choices, it is also a threat to all citizens of the world who want safe food. This case demonstrates why citizens must have clear standing in any legitimate global trade regime. Current WTO rules and dispute mechanisms embody corporate unilateralism, and must be changed to reflect democratic multilateralism on the basis of citizen's rights.

3. Scientific evidence: Instability and Uncertainty

From erosions (early ulcers) in the stomachs of rats fed GM tomatoes in the lab, to triple-herbicide resistant oilseed rape volunteers plaguing Canadian fields, scientific evidence points to the dangers of GMOs. Biotech proponents fund numerous studies to try and show that their GMO products are safe, but the scientific evidence points conclusively to two things about genetic engineering; uncertainty and instability.

Uncertainty - Contrary to the image projected by the biotech industry, biologists do not fully understand what causes a trait to be exhibited in a living organism. What is clear is that they

are not determined by DNA alone, but through complex interactions within a cell. It is not surprising that the vast majority of attempts to "genetically engineer" living matter usually fail. Almost every major report on GMO's cites the need for further study.

Instability - There is significant evidence that Genetic Modification brings transgenic instability. When foreign genes inserted into a living organism they behave in volatile and unstable ways. Often they fail to produce the expected result, which would explain crop failures of GM crops like the ones seen in India last year. Even more frightening, the genes can be functional and "break free." These genes can stack up, as in the case of triple herbicide-tolerant oilseed rape volunteers appearing in Canada within two years of the planting of single-herbicide tolerant crops. These genes can even be transmitted to other organisms. Genes for herbicide resistance have been transferred from GM crops to weeds, creating potential "super weeds."

In 22 years the only agricultural products that have been commercialized are herbicide resistant and BT crops. The science at the genetic level is still in its infancy and commercialization is obviously premature.

4. Precautionary Principle

The precautionary principle is the antidote to short-term thinking and the excesses of unaccountable industry. This basic premise is that when (on the basis of available evidence) an activity may harm human health or the environment, a cautious approach should be taken in advance. It recognizes that in complex biological systems, direct cause-and-effect proof of harm is not easy to demonstrate until irreversible damage is done.

In the past people have been exposed to deadly doses of radiation, bio-accumulative pesticides like DDT, and countless other toxins and pollutants long after serious health concerns had been documented. The precautionary principle is based on these experiences, and has been enshrined in numerous international environmental treaties, conventions and political declarations, including the Biosafety Protocol (see below).

There are serious concerns about the threat of GMO's to human health, and there is conclusive proof of the dangers of "genetic pollution" in the environment. The US is taking the opposite of a precautionary approach with its "Don't look, don't find" approach to monitoring GMO's after commercial release. The US Department of Agriculture, from 1992 to 2002, spent only 1% of is biotech research budget on risk-related research. The US is globalizing a culture of scientific irresponsibility by initiating this dispute against Europe, and by refusing to become a member of the Convention on Biological Diversity and the Biosafety Protocol.

5. Biosafety Protocol

The Biosafety Protocol is an international framework for dealing with GMO's, which was the outcome of over 10 years of negotiations under the convention on biological diversity. It is designed to protect biodiversity and its sustainable use from the potentially negative effect of the transboundary movement of GMOs, defined as Living Modified Organisms (LMOs). The protocol also refers to human health and socio-economic impacts. It allows countries to invoke the precautionary principle and prevent the import of GMOs in certain cases. Justifying US opposition to a strong biosafety protocol, Rafe Pomerance, head of the US delegation at the negotiations in Cartagena stated: "This is about a multimillion dollar industry."

The Biosafety Protocol is in essence about regulating trade in GMOs by giving primacy to safety. Any WTO jurisdiction in this area should clearly be limited by this. For the US to claim that the EU moratorium is an unfair barrier to trade is to deny the existence of the biosafety protocol, and to deny the world community the right to set basic health and environmental standards.

6. Socio-Economic Failures

The primary reason cited for pushing GM crops on unwilling citizens is that they will produce more food and thus will remove hunger and increase incomes of poor farmers. However independent evaluations show that they are no socio-economic advantages to GM crops. In fact there are serious socio-economic costs because GM seeds are more expansive and require payment of royalty and technology fees.

Under field conditions GM crops have often performed much worse than their non-GM counterparts. In 2002, the first commercial planting of Bt cotton in India was wiped out while non-GM varieties performed well, leaving GM planting farmers facing serious financial losses.

The Strategy Unit of the UK Cabinet Office also showed that GM crops have no socio-economic advantages but could create ecological risks and political unrest. (Field Work: *Weighing up the Costs and Benefits of GM Crops* Strategy Unit of the Cabinet Office, UK) Even the United States Department of Agriculture has had to recognize that GM crops do not bring exceptional benefits to farmers.

7. There Are Alternatives

For every application for biotechnology in agriculture offered by industry so far there are safer and more sustainable alternatives available. Ecological management of pests and weeds is a proven option to genetically modified herbicide resistant and Bt crops. 208 sustainable agriculture projects in 52 developing countries have shown productivity increases from 50 to 100%. (*Reducing Food Poverty by Increasing Agriculture Sustainability in Developing Countries*, J. N. Pretty et al.)

In Latin America rotations, green manures and cover crops have increased yield from 20% – 250%. (*Applying Agro-ecology to Enhance the Productivity of Peasant Farming System in Latin America*, Miguel Altieri, 2001). Even proposed future crops, such as the genetically modified Golden Rice and the Protein Potato, are inferior to natural alternatives for meeting the nutritional needs of the poor.

8. Conclusion

Given the abundance of alternatives, the risks that GM crops pose to the environment and human health, the existing Biosafety Protocol, the scientific uncertainty, and the lack of any socio economic advantages, we declare that this use of the WTO dispute settlement system for imposing GM food on the world is totally illegitimate. We also declare our support for the right of all citizens to choose safe food, and the duty of governments to protect the health of their people and their environments by refusing GM food.

Sign on at *gmochallenge@yahoo.com*

Websites/E-mail addresses of organisations involved in GMO issues (mentioned in the report)

Greenpeace International
Headoffice: Amsterdam, The Netherlands
E-mail: supporter.services@int.greenpeace.org
Greenpeace has national and regional offices in over 40 countries. Contacts see Greenpeace website.
www.greenpeace.org/international

Friends of the Earth International
Secretariat Amsterdam, The Netherlands
www.foei.org

IFOAM
E-mail: Headoffice@ifoam.org
www.ifoam.org; www.ifoam.net.org

Gaia
Provides information on GMOs
E-mail: gaia@gaianet.org

GENET
European NGO Network on Genetic Engineering, headoffice in Germany
www.genet-info.org

GM Watch
Norwich, UK, provides information on GMOs
E-mail: ngin@gmwatch.org;
www.gmwatch.org/

Grain
International NGO. Promotes the sustainable agricultural biodiversity based on people's control over genetic resources and local knowledge. Head office in Barcelona, Spain
E-mail: grain@grain.org

Independent Science Panel
London, UK. International scientists engage in the Genetic Modification Group of the ISP.
Dr. Mae-Wan Ho, Institute of Science in Society www.i-sis.org.uk
Independent Science Panel www.indsp.org

BioWatch
South Africa
www.biowatch.org

SAFeAGE
Cape Town, South Africa
E-mail: safeage@mweb.co.za;
www.safeage.org

Earthlife Africa (ELA)
ELA mobilises civil society around environmental issues. Three branches in South Africa and one in Namibia.
www.earthlife-ct.org.za

Third World Network
International secretariat Penang, Malaysia. Offices in Delhi, India; Montevideo, Uruguay; Geneva, Switzerland; and Accra, Ghana.
www.twnside.org.sg/

GMR Watch Center
Japan
www.gmrwatch.org

Monsanto Quit India
Bija Satyagraha, India
National Alliance of Women for Food Rights
Contact through RFSTE/Navdanya

Organic Consumers Association
Head office: Little Marais, MN, USA
www.organicconsumers.org
www.organicconsumers.org/ge/australia

Five Year Freeze
UK
www.fiveyearfreeze.org

Slow Food
www.slowfood.com; for individual countries www.slowfood/it, www.slowfood/fr etc.

The Polaris Institute
Ontario, Ottawa, Canada
Enables citizen movements to fight against corporate-driven globalisation and for democratic social change
E-mail: polarisinstitute@on.aibn.com;
www.polarisinstitute.org

For further information regarding movements for GMO-free Food:
Navdanya/Research Foundation for Science, Technology and Ecology
A-60, Hauz Khas, New Delhi–110 016, India
E-mail: rfste@vsnl.com; vshiva@vsnl.com;
www.vshiva.net

Legal framework for Biosafety and GMOs

A/ International background

The whole system of governance of the GMO evolves towards biosafety.

Concern over the potential impact of genetically modified organisms (GMOs) on biodiversity has led to a call for international regulation of the movement of GMOs across national borders. The first informal recognition of the need for international cooperation came in 1992 at the United Nation's Conference on Environment and Development in Rio de Janeiro. Agenda 21 called for the creation of an international protocol on biosafety and risk assessment. In addition, it called for a precautionary approach to the use of GMOs.[1]

The UNEP *Cartagena Protocol on Biosafety*[2] to the *Convention on Biological Diversity (CBD)*[3] was adopted in January 2000. It provides an international framework for dealing with GMOs, which was the outcome of over 10 years of negotiations under the CBD.

The overall purpose of this United Nations agreement is to establish common rules[4] to be followed in transboundary movements of GMOs in order to ensure, on a global

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[1] *Principle 15* codified the first time at the global level the precautionary approach, which indicates that the lack of scientific certainty is no reason to postpone action to avoid potentially serious or irreversible harm to the environment. Central to principle 15 is the element of anticipation, reflecting a requirement that effective environmental measures need to be based upon actions which take a long-term approach and which might anticipate changes on the basis of scientific knowledge. This approach is also included in the *ninth preamble paragraph of the Convention on Biological Diversity, see Annex I.* (http://www.gdrc.org/u-gov/precaution-7.html)

[2] Work on this protocol began in Cartagena, Colombia, in February 1999 and the final agreement was adopted in Montreal, Canada, in January 2000.It entered into force on 11 September 2003. It has been signed by over 100 countries and currently 87 countries are parties to the Treaty. For ratification see *Annex II.*

[3] The Convention on Biological Diversity is the international treaty that was signed at the Earth Summit in Rio de Janeiro in 1992. It came into force in 1993 and now has 182 contracting parties.

(For an overall view of *the CBD system,* operational institutions and procedures: Environmental Governance and Institutions/Multilateral Agreements Status: Convention on Biodiversity; http://earthtrends.wri.org/text/GOV/variables/610notes.htm)

[4] The Protocol establishes an *Advanced Informed Agreement (AIA) procedure (article 11*:http://www.biodiv.org/biosafety/articles.asp?a=bsp-11&print=1) for ensuring that countries are provided with the information necessary to make informed decisions before agreeing to the import into their territory of GMOs intended for deliberate release into the environment (this includes all vegetative parts that are meant for planting such as seeds). However, the AIA procedure does not apply to GMOs which are for human consumption (food), for animal feeds or for processing. For these, relevant information has to be provided to the Parties through the Biosafety Clearing House (a mechanism set up by the Protocol to facilitate the exchange of information on GMOs, including national regulation pertaining to them, and to assist countries in the implementation of the Protocol). Moreover, these commodities, when exported, must be accompanied by documentation specifying that they "may contain" GMOs and that they are not intended for intentional introduction into the environment. The Parties shall decide on the detailed requirements for this purpose, including specification of the identity of the GMOs and any unique identification (http://agbiotech.ifas.ufl.edu/biodiversity.html).

scale, the protection of biodiversity and of human health. It is intended to ensure through agreed international rules that countries, exporters and importers have the necessary information to make informed choices about GMOs.

Both the CBD and the Cartagena Protocol rest on a strong interpretation of the *precautionary principle:* member nations are allowed to ban import of GM seeds that they regard as environmental threats, even without extensive scientific justification.

The precautionary principle has been enshrined in numerous other international instruments.[5]

Several countries, including EU have adopted a case by case authorization process for GMOs but authorizations are not always synchronous with US approvals. Others, such as Sri Lanka, which have not yet adopted a regulatory framework, have banned the import of GMOs. Even China, which has one of the largest biotech industry is now taking a cautious approach with the authorization of GM food.

In Africa, also, many governments are in various stages of developing biosafety regulation. However, United States Agency for International Development (USAID) have won $15 million from the US administration to influence the development of biosafety legislation in developing countries.[6]

Rogue State

The US is taking the opposite of precautionary approach with its "Don't look, don't find"[7] approach to monitoring GMO's after commercial release.

The US opposes the biosafety protocol because the enforcement of the protocol will interfere with the main US agriculture commodity exports, i.e. maize and soybeans.

The US campaign for the ***international deregulation of GMOs trade*** began in the early 1990 (Forum shifting).

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[5] *Annex III*: Incorporation of the precautionary approach (http://www.gdrc.org/u-gov/precaution-7.html)

[6] "...we fear that this will mean a watering down of legislation to the lowest possible biosafety standards. On the other hand, Germany is providing $2 million to fund the development of biosafety legislation for Africa. The emphasis and standards will be different because where Germany has signed the Biosafety Protocol, the US has not, and is opposed to it. The German project, however, has the endorsement of member states of the African Union. The two schemes will almost certainly come into conflict with each other" (Source: Gaia Foundation briefing "Genetic Engineered Crops in Africa: Biotechnology Investment & Biosafety Implementation; October 2003).

[7] American society has been guided by the *"risk analysis" model*, which assesses new technologies by trying to calculate the mathematical likelihood that they will harm the public. The problem with risk analysis, which came out of the world of engineering and caught on during the late 70's, is that it has done a terrible job predicting the ecological and health effects of many new technologies. It is very good at measuring what we can know but has trouble at calculating subtler, less quantifiable risks. What ever can't be quantified falls out of the risk analyst's equations, and so in the absence of proven, measurable harms, technologies are simply allowed to go forwards.

But the backlash effectively started in 1999 at the WTO conference of Seattle. It marks the beginning of a sustained pressure applied by the US for the issue of trade in GMOs to be dealt with by the WTO, where the conventional probabilistic risk assessments[8] play a major role in its rulings about the safety of GMOs, rather than under the emerging UN Biosafety Protocol.

The recent agreement signed with Mexico (a trilateral agreement with the US and Canada) undermines the expressed desire of the majority of the parties to have strong provisions on liability and contamination. This constitutes a clear attempt to water down the Protocol and impose weaker standards on biosafety.

Today, the WTO Challenge is the masterpiece of the US strategy that seriously hampers the multilateral efforts made so far in forum as the Biosafety protocol. It is clearly aimed at killing the Protocol and dragging the GMOs issue into a predominantly trade-related organization.

Culture of scientific irresponsability

The US is trying to globalize a culture of scientific irresponsibility by initiating this dispute against Europe, and by refusing to become a member of the CBD and the Biosafety Protocol.

B/ WTO case

The US forum shifting

The WTO is not the appropriate platform to bring a case such as the US challenge against the EU moratorium[9] on GMOs. There is an international regulatory framework already in place based on biosafety: the Biosafety protocol. The Meeting of the Parties (MOP)[10] provides an open forum and not a legal system framed to be used as it pleases the USA. The civil society organizations not only played a major role in encouraging governments to agree on the need for international legal instruments to regulate the conservation of biodiversity and the use of plants genetic

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[8] The question of *burdens of proof.* WTO regulations assume that new products are safe until proven otherwise: the burden of proof falls heavily on those who are worried about unforeseen or untested safety and environmental issues. The debate about the safety of the bovine somatotropin (BST) growth hormone is a recent example. It has fallen to the European Union (EU) to provide evidence to support its doubts, rather than the producer of BST to demonstrate its safety. So the burden of proof falls on the regulator rather than the proponent of the technology. The burden of proof should be re-balanced through enhanced and transparent testing of new products, similar to the current method for testing and approving drugs. Likewise, there is a need for better scientific monitoring of the effects of new technologies once in use. Hormone-disrupting chemicals exemplify the issue of inadequate monitoring. Assuming that products are safe until proven otherwise may lead to what can be described as 'soft disasters' -large-scale health and environmental problems that emerge slowly but at high cost to society. Such disasters mostly occur because excessive faith has been placed upon limited data about the safety of a product or process, ignoring many possible eventualities where there is little or no information These comments are based on research carried out within the Global Environmental Change Programme of the UK Economic and social Research Council (ESRC)(http://www.ecoglobe.org/nz/news1999/n309news.htm).

[9] *Annex IV:* Moratorium, Historical background
(http://www.genewatch.org/WTO WTO_background.html)

[10] The first Meeting of the Parties (MOP1) to the Cartagena Protocol on Biosafety took place the last week of February 2004 in Kuala Lumpur, Malaysia.

resources for food and agriculture but had a lot of influence on the actual texts of the agreement.

The USA seeks to remove decisions regarding health, food and safety from a democratic forum driven by ecological sustainability and social justice and delegate them to such international standard-setting bodies as WTO and its Codex Alimentarius[11], an elite club of scientists located in Geneva, largely controlled by big food and agribusiness corporations.

The Trade Related Intellectual Property Rights (TRIPs), a GATT/WTO's agreement, has globalized US-style patent laws (basis of biopiracy[12]). It was not negotiated by GATT members. It was imposed by Multinational Corporations (MNCs, like Dupont, General Electric, IBM, Monsanto, Pfizer...) who used the US Government to force it on other members. It is one blatant example of the undemocratic, non-transparent nature of the WTO. It militates against people's human right to food and health by conferring unrestricted monopoly rights to corporations in the vital sectors of health and agriculture. Patents on plants and seeds imply that corporations which have the patent claim that a seed or a plant or crop variety is their invention and exclude others from making, selling, using or distributing the seed or crop.[13]

The WTO doesn't allow countries to make value judgments or take social priorities into account in food-safety or public-health policy, even in a non-discriminatory way (between national and foreign producers and among different foreign producers).

The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) also adopts by reference international standards biased in favor of business, such

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[11] Together with the SPS Agreement (Agreement on the Application of Sanitary and Phytosanitary Measures) the *TBT (Agreement on Technical Barriers to Trade)* are treaties enforced by the World Trade Organization. These treaties have also been interpreted to drag down democratically chosen consumer-safety standards. Among other restrictions, TBT limits the right of countries to adopt standards more stringent than those set by the International Organization for Standardization (ISO).

[12] "...US-style patent laws are designed to grant patents for new inventions based on denial or non-recognition of *prior art* elsewhere, they allow patents to be granted for existing knowledge. This is the basis of biopiracy. Paradoxically then, a legal system aimed at preventing "intellectual piracy" is itself based on legitimizing piracy." Vandana Shiva, *Patents: myths & reality*, pg18, Penguin Books India, 2001.

[13] Prior to Uruguay Round, IPRs were not covered by GATT. Each country had its own national IPR laws to suit its ethical and socioeconomical conditions. The *TRIP agreement* which has expanded patents to cover life forms (art 27.5.3 (b)) undermines the potential and promises of the CBD (conservation, sustainable utilization and equitable benefit sharing). There are two trends in plant patents that create a threat to biodiversity, the survival of small farmers, and the food security of all people. The first trend is for broad species patents such as those held by Agrecetus (now owned by Monsanto) on cotton and soybean. The granting of patents covering all GE varieties of a species, irrespective of the genes concerned or how they were transferred, puts on the hands of a single inventor the possibility to control what we grow on our farms and in our gardens. Secondly, patent protection implies the exclusion of farmers' right over the resources having these genes and characteristics. This will undermine the very foundation of agriculture. In other words, this makes not only farmer's breeding an illegal activity but also forces them to give up their inalienable rights to save, exchange and improve seed (cf. further *Schmeizer case* outcome)
Vandana Shiva, *Patents: myths & reality*, pg73, 76, 95, 97,102; Penguin Books India, 2001.

as some of those of the Codex Alimentarius and the International Organization for Standardization (ISO). Rather than set floors on safety provisions, allowing nations and localities to set higher levels of safety and protection, the WTO does the reverse: it sets ceilings and can be used to strike down any protections that exceed them.

The WTO is unbalanced by failing adequately to meet wider interests than those of the people and businesses that profit directly from the global trade system.

Inappropriate dispute

The US move is legally unwarranted, economically unfounded and politically unhelpful.

On May 13th 2003, the US together with Canada and Argentina[14] challenged Europe's moratorium on GM crops and foods. Arguing that their GM products were being unfairly discriminated against, they challenge the precautionary principle in decision-making about GM crops that is supposed to be embodied into European decision-making. Bringing this case to the WTO is another excuse to attack the use of the precautionary approach in international law.

The new EU Regulations take account of the EU's international trade commitments and of the requirements of the Cartagena Protocol on Biosafety[15] with respect to obligations of importers. The EU's regulatory system[16] for GMOs authorization is in line with WTO rules: it is clear, transparent and non-discriminatory. There is therefore no issue that the WTO needs to examine.

Many countries are now looking at the EU policy to develop their own policy. The US fears that several countries will adopt a similar approach as the EU to regulate GMOs and GM food and feed products. The new Swiss GM legislation, entered into force on January 1st 2004, is a good example.

The Swiss law is stricter than current EU legislation on the liability and co-existence aspects. It is based on the precautionary principle and "the polluter pays" principle (Article 1) and aims to protect health and security of human beings, animals and environment. It also aims to permanently maintain biological diversity and fertility of the soil and to allow freedom of choice for consumers[17].

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[14] Argentina, Canada and the US have bought separate cases to the WTO (Ref. DS293, DS292 and DS291 respectively). These cases are, however, essentially the same and the panel which was established by the WTO Dispute Settlement Body on the 18th August 2003, will deal with the three together.

[15] The implementation of the Cartagena Protocol on Biosafety into EU legislation relies on a wide range of biotechnology legislation applying to the use of GMOs within the European Union, including imports. The center part of this legal framework is the Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms. It is completed by the Regulation on the transboundary movements of GMOs, which was adopted in June 2003. The EU has developed a comprehensive regulatory framework for GMOs and for GM food and feed including traceability and labeling provisions.

[16] *Annex V:* Change in EU regulation on GMOs (IP/03/681; http://www.cenrce.org/fre/caucuses/biotechnology/docs/eu_response_to_us_challenge.pdf)

[17] http://www.foeeurope.org: Publication, FoEE Bulletin- April 2004

The EU Moratorium represents the will of its people not to be force-fed. It crystallizes (as the patent on seeds still does[18]) the worldwide mobilization of people against the reinterpretation of national security and sovereignty to increase the global control of US corporations over resources and market.

If Europe had not suspended its approvals process in 1998, these would have been some of the consequences:

- The indirect effects of growing GM herbicide tolerant (HT) crops on farmland wildlife would not have been taken into account. GM HT sugar/fodder beet and spring oilseed rape now known to be damaging to farmland wildlife would have been grown commercially in Europe.
- No requirement for monitoring of environmental or human health effects would have been introduced, maintaining the 'no evidence of harm' claim for safety.
- Consumers would not have been able to make a choice not to eat products derived from GM crops as the new labeling laws now allow for.
- There would have been no traceability requirement for GM foods. If an adverse effect had emerged, it would have been impossible to withdraw the product from the market quickly and easily. Following BSE, traceability is a cornerstone of European food safety systems.

We have to reclaim our right to nutrition and food safety. An important mean for the global citizen to reclaim their right for democratization of the food system is to intervene at the WTO.

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[18] Intellectual property rights (IPR) is another extremely important issue. The patents on seeds prevent farmers from saving and reusing a part of their harvest for next season.

The *Schmeiser case* is of utmost importance in view of the patenting seeds and the burden of responsibility in the case of contamination.

The Canadian farmer Percy Schmeiser was trailed for having planted GM canola containing genes of the US company Monsanto, of which he had not acquired the proprietary licensing agreement. He was never accused nor condemned of stealing Monsanto's GE canola seeds. He was accused of infringing Monsanto's patenting rights by having RoundupReady canola in his fields, regardless of the fact that these seeds got there accidentally. The first ruling issued by the Federal Court of Canada (confirmed in appeal) extended the rights of patent holders even to cases where proprietary genes cross into neighboring plants by means of natural pollen drift or by accident (cf. Part C : the issues of co-existence and liability in EU). After these two lower courts found in Monsanto's favor and ordered Schmeiser to pay the company about $140,000 in damages and legal costs, the Supreme Court of Canada *has exonerated* Mr. Schmeiser on May 22, 2004. He is not forced to pay Monsanto anything as he did not profit from the presence of RR canola in his fields but the Court determines Monsanto's patent is valid.

Monsanto will have a hard time in pursuing patent infringement against other farmers. They are now going to have to prove that a farmer profited from having RR canola in their field. The Court noted that Schmeiser profits were the same whether he had conventional canola or RR canola, so it's going to be hard for Monsanto to say in any future case that the farmer made more money because of their product.

There is also the liability issue, the concern about the lack of responsibility that Monsanto took for the unconfined release of RR canola in western Canada. Apparently the Court's decision (that they have ownership to the plant and that Schmeiser has infringed by having it in his field) will force them to be held accountable for it now: *with ownership comes responsibility.*

Now it is *clear that a company's patent will take precedence over the rights of farmer's to save and reuse their seed.*

Farmers now may lose their ability to continue with this practice. The Canadian Parliament must act to ensure that farmer's rights are protected. The playing field between farmer's rights and the biotech companies rights has been tilted towards the companies with this decision (www.percyschmeiser.com).

As such, the WTO case illustrates how the US simply wants to ***bully***[19] countries into accepting the technology on terms favorable to the biotech industry.

Summary of the US/EU case[20]:

The legal discussion of section IV spells out the underlying justification the US believes it has for bringing the case. It is entirely based on the WTO/SPS Agreement[21]. The SPS Agreement (Agreement on the Application of Sanitary and Phytosanitary Measures) provides for restrictions on trade in relation to food safety and animal and plant health if scientifically justified. For legal reasons, the US spends time arguing that the moratorium is a 'measure' under the SPS and so should be subject to the procedural requirements of the agreement. Having done this, the US argues that there was:

- *'undue delay'* – Europe simply did not assess applications quickly enough under the existing European GM rules (which were under revision at the time). Under the SPS Agreement, 'undue delay' is an unjustified barrier to trade.
- Europe did *not 'publish promptly'* details of its moratorium as required under the SPS Agreement.
- *the moratorium is inconsistent with 'procedural requirements' of Article 8 and Annex C (1) (B) of the SPS* because Europe has not produced and the moratorium is not based on a formal 'risk assessment'.
- the moratorium makes an *arbitrary distinction between GM crops and foods and food processing aids* (such as enzymes extracted from GM micro-organisms grown in a factory).
- Member State bans on certain GM crops are maintained *without a proper risk assessment or sufficient scientific evidence.*

What emerges from the US legal arguments is that whilst stating that Europe had no scientific justification for its moratorium, the legal argument is not based on the substantive issues surrounding safety and choice, but on whether Europe followed proper procedures. In effect, the US is ***using technicalities*** to push its agenda forwards.

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[19] If the US fails, it is set to bring a second case to prevent GM foods being labeled and traceability of drops being mandatory. Both these elements became EU law the 19th of May and are likely to form a second case to the WTO as a "restraint" of trade if victory is not total in round one (http://www.thecampaign.org/News/april040.php).

[20] Most of the arguments used in this section has to be find on the Genewatch website: http://www.genewatch.org/WTO/WTO_US_Submission_background.htm

[21] This treaty "sets constraints on government policies relating to food safety and animal and plant health, from pesticides and biological contaminants to food inspection, product labeling and genetically engineered foods." (http://www.wto.org/english/tratop_e/sps_e/spsagr_e.html)

"Under the SPS Agreement, WTO may force a nation to choose between weakening its health standards for humans, animals, or plants, or paying an international penalty. The penalty can take the form of either compensating the foreign government whose exports to the nation are limited by the stricter standard or permitting that country to impose additional trade restrictions on exports from the nation with the more protective health standard." Bruce Silverglade, Director of Legal Affairs, Center for Science in the Public Interest, U.S.

The WTO SPS Agreement has already been used to defeat the use of the 'precautionary principle'. A WTO tribunal held that this principle could not be a justifiable basis upon which to establish regulatory controls.

The USA pays no attention to the changes in regulation and scientific research taking place during the moratorium period which were required to improve the scientific quality of the risk assessment and management of GM crops and foods in Europe.

Europe has been working hard to complete its regulatory system in line with the latest scientific and international developments. "The change in legislation was essential to restore consumer confidence[22] in GMOs in Europe." Mr. Byrne recalled that it is the lack of consumer demand for GM-products that accounts for the low sales of GMOs in the EU market. "Unless consumers see that the authorization process is up to date and takes into account all legitimate concerns, consumers will continue to remain skeptical of GM products.

When reviewing the individual member state bans on GMOs in section III (Statement of the facts), even if they had been approved at the EU level, they argue that they were maintained without a proper risk assessment or sufficient evidence, the US fails to acknowledge the right[23] of the European people to require the introduction of improved rules protecting human health and the environment.

Leaving out the changes in regulation the US fails to acknowledge that the lack of demand, not any regulatory delays, has led to the loss of international trade in GM crops.

C/ Local/Regional Level

GMO free zone Chart/vote of the citizens for a GMOs free world

Although the looming WTO sanctions place increasing pressure on the EU Commission and the Council of ministers to show willing by allowing crops and consequently to loosening its de facto moratorium, local initiatives don't stop.

The European Commission authorized[24], on May 19th this year, the placing on the

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[22] The case for appropriate approval mechanisms and marketing regulations has been reinforced by the problems experienced in the US. The *"Starlink" case* is a clear example of the need for appropriate rules for authorization and traceability of GMOs. In 2000, GM corn not approved for human consumption was found to have entered in large amounts the US food supply chain; More than 300 product brands had to be recalled from supermarkets by US authorities. In a study of February 2002, the American National Academy of Sciences concluded that there are a number of inadequacies in the way GM plants are regulated in the US.

[23] The national countries can invoke the *"safeguard measure"* included in art 16 Directive 90/220 or in the Novel Food Regulation (EC) N258/97.

[24] This decision is valid for 10 years. Any imports of the canned vegetable will have to show clearly on the labeling that the corn has been harvested from a genetically modified plant. Grain from the GM maize line Bt11 has been authorized for import into Europe since 1998 and is widely used in the EU in feed (Authorization granted on 22 April 1998 in accordance with Council Directive 90/220/EC) and in derived food products (Notification of 6 February 1998 pursuant to Article 5 (substantial equivalence) of Regulation (EC) 258/97). The labeling will have to show clearly that the corn is a GMO in line with the new EU legislation. An authorization for cultivation for Bt11 maize is pending and has not yet been granted.(http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.gettxt=gt&doc=IP/04/663/0/RAPID&lg=EN;)

See also *Annex VI:* Genetically Modified (GM) Foods authorized in the European Union. (http://europa.eu.int/rapid/searchResultAction.do#fn1)

market by the company Syngenta of labeled canned or fresh sweet corn (maize) from GM line Bt11[25].

This is the first authorization of a GM plant or food in the EU since 1998.

As I pointed out in the earlier paragraph, the EU has updated its laws to reflect better concerns of the public, scientists and some Member State Governments surrounding GM crops and food. However, this approval was given under the previous rules. The EU's new regulations covering GM food safety which became law on 19th April 2004 have not yet been fully implemented.

The unelected European Commission has obviously bowed to pressure from US, despite having to overrule the elected Member State Governments.

In his statement, David Byrne, EU Health and Consumer Protection Commissioner, talked about the 'stringent' system the EU had put in place over the last 4 years to regulate GM plants but did not mention that this maize had just been passed under old regulations even though new laws are now technically in place.

Neither liability for GMOs or co-existence are covered[26] in the revised EU Deliberate release Directive. It is up to the Member States to initiate legislation to protect non GM farmers and non GM operators against the unwanted presence of GMOs in their products and to ensure the availability of GM free supply, necessary to provide freedom of choice for consumers. The EU members states are allowed to do so on the basis of article 26a of Directive 2001/18. Since they feel that so far the Commission has failed to protect their interest, some regions have already made their own laws.

That's the result of Europe's largest grassroots environmental network that has launched a campaign "GE-Free Zones" to demand better legal protection for areas wanting to ban genetically modified (GM) crops. The different GM-free initiatives from regions represent tens of millions of people (in at least 22 different European countries). Actions taken so far range from regions introducing local laws to ban cultivation, to public authorities lobbying both Europe and national Governments for legal protection.

The number of regions in the EU that want to ban the growing of GM crops is continuously growing. Initiatives have started in at least 22 European countries. In France over 1000 town mayors support GM free zones and in the UK over 44 regions have called for special protection in their areas. More than 500 cities in Italy have also taken a position against the use of GMOs in agriculture.

The campaign will increase pressure on the European Commission, who in January admitted that it would *"be difficult to reject these attempts at establishing GM-free zones, which are driven by strong public local concern and economic considerations (such as protection of local traditional agriculture)"*[27].

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[25] The *Bt11 maize line* first applied for marketing consent in 1996, it was granted a license for import by the UK government in June 1998. The maize contains a Bt insect resistant gene and a glufosinate ammonium herbicide tolerance gene. Until today it could be imported into the EU and not used for human food. A report commissioned by the Austrian Government previously questioned the adequacy of the Bt11 application. (http://www.umweltbundesamt.at/publikationsdetail.html?&pub_id=1066)

[26] The proposal for a Directive on Environmental liability with regard to the prevention and restoration of environmental damage"(COM (2002)21) fails to address the problem. The Commission Recommendation on coexistence is not legally binding. (http://www.foeeurope.org/GMOs/european_legislation/liability.htm AND position paper on coexistence 11/11/2003 to find on FoEE website)

[27] Commission press release, 28 January 2004, GMOs: Commission takes stock of progress.

This is a summary of some of the most visible initiatives[28].

Austria

Eight out of the nine Austrian provinces have now indicated that they want to go GMO-free. Over 100 municipalities have also signed a GMO-free resolution. The region of Upper Austria has passed a law making it a GMO-free zone. Five other provincial parliaments (Salzburg, Tyrol, Burgenland, Steirmark and Lower Austria) have also demanded their governments to declare their province GMO-free.

Belgium

39 communities in the Flemish and 81 communities in the French speaking part of Belgium have declared themselves GMO-free.

France

In France more than one thousand mayors have issued declarations of GMO-free status of their municipality. At a regional level, three regions have issued GM-free: Alps de Haute, Aquitaine and Limousin.

Greece

Currently 27 out of the 54 Greek prefectures have voted to declare their area GMO-free and nine more are in the process of doing so. The prefecture of Rhodope and the Drama Kavala - Xanthi County have joined the European Network of GM-Free regions.

Italy

The Italian campaign "Communi Antitransgenici" (GM-free municipalities) started in 1999. The campaign has joined the Italian Association of "Wine Cities" (Citta del Vino). This network of cities dedicated to wine production has approved a decision to declare all 400 members as "GM-free land". Thus at the end of 2003 more than 500 cities in Italy have taken a position against the use of GMOs in agriculture, including Rome, Milan, Turin, Brescia and Genoa. The combined area of those communities that have already signed a resolution against GMOs and those that recently have indicated to ban GMOs, nearly 80% of Italy's territory is declared GMO-free.

Slovenia

The Bio-region ALPE ADRIA, covers the whole area of Slovenia, the Austrian provinces of Carinthia and Styria and the Italian provinces of Friuli-Venezia Giulia and Veneto. In June 2003, a joint GMO-free statement was signed by the presidents of organic farmers associations from these five Alpine regions.

UK

So far 44 areas (this includes: 12 County councils, 9 Unitary authorities, 2 Metropolitan districts, 1 London Borough, 13 District councils, 2 National Parks Authorities, 5 Town/ Parish councils) in England and 35 councils in Wales have approved a GMO-free resolution, bringing the total UK population living in areas with a GMO-free policy to 14 million.

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[28] http://www.organicconsumers.org/biod/euupdate042304.cfm

ANNEX I : Convention on Biological Diversity (CBD)/Preamble

"The Contracting Parties,

Conscious of the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components,

Conscious also of the importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere,

Affirming that the conservation of biological diversity is a common concern of humankind,

Reaffirming that States have sovereign rights over their own biological resources,

Reaffirming also that States are responsible for conserving their biological diversity and for using their biological resources in a sustainable manner,

Concerned that biological diversity is being significantly reduced by certain human activities,

Aware of the general lack of information and knowledge regarding biological diversity and of the urgent need to develop scientific, technical and institutional capacities to provide the basic understanding upon which to plan and implement appropriate measures,

Noting that it is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source,

Noting also that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat,

Noting further that the fundamental requirement for the conservation of biological diversity is the in-situ conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings,

Noting further that ex-situ measures, preferably in the country of origin, also have an important role to play,

Recognizing the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components,

Recognizing also the vital role that women play in the conservation and sustainable use of biological diversity and affirming the need for the full participation of women at all levels of policy-making and implementation for biological diversity conservation,

Stressing the importance of, and the need to promote, international, regional and global cooperation among States and intergovernmental organizations and the non-governmental sector for the conservation of biological diversity and the sustainable use of its components,

Acknowledging that the provision of new and additional financial resources and appropriate access to relevant technologies can be expected to make a substantial difference in the world's ability to address the loss of biological diversity,

Acknowledging further that special provision is required to meet the needs of developing countries, including the provision of new and additional financial resources and appropriate access to relevant technologies,

Noting in this regard the special conditions of the least developed countries and small island States,

Acknowledging that substantial investments are required to conserve biological diversity and that there is the expectation of a broad range of environmental, economic and social benefits from those investments,

Recognizing that economic and social development and poverty eradication are the first and overriding priorities of developing countries,

Aware that conservation and sustainable use of biological diversity is of critical importance for meeting the food, health and other needs of the growing world population, for which purpose access to and sharing of both genetic resources and technologies are essential,

Noting that, ultimately, the conservation and sustainable use of biological diversity will strengthen friendly relations among States and contribute to peace for humankind,

Desiring to enhance and complement existing international arrangements for the conservation of biological diversity and sustainable use of its components

Have agreed as follows:"

ANNEX II : Biosafety Protocol signatures

(Source: http://www.biodiv.org/biosafety)

As of 10th May 2004, 97 instruments of ratification or accession have been deposited with the UN Secretary-General from the following parties to the Convention on Biological Diversity:

Africa

Botswana, Burkina Faso, Cameroon, Djibouti, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Liberia, Madagascar, Mali, Mauritius, Mozambique, Nigeria, Senegal, South Africa, Tunisia, Uganda, United Republic of Tanzania, Zambia

Asia and Pacific

Bangladesh, Bhutan, Cambodia, Cyprus, Democratic People's Republic of Korea, Fiji, India, Iran, Japan, Jordan, Kiribati, Malaysia, Maldives, Marshall Islands, Mongolia, Nauru, Niue, Oman, Palau, Samoa, Sri Lanka, Syrian Arab Republic, Tajikistan, Tonga, Viet Nam

Central and Eastern Europe

Armenia, Belarus, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Republic of Moldova, Romania, Slovakia, Ukraine

Latin America and Caribbean

Antique and Barbuda, Bahamas, Barbados, Belize, Bolivia, Brazil, Colombia, Cuba, Ecuador, El Salvador, Grenada, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Trinidad and Tobago, Venezuela,

Western Europe and other groups

Austria, Belgium, Denmark, European Community, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland

ANNEX III : Incorporation of the precautionary approach

International legal instruments

For example, the 1995 Agreement on Fish Stocks adopts the precautionary approach in article 6, and its article 5 (c) states that the application of the precautionary approach is one of the general principles of the Agreement; see also annex II to the Agreement, "Guidelines for the application of precautionary reference points in conservation and management of straddling fish stocks and highly migratory fish stocks". The precautionary approach is also included in article 3.3 of the Convention on Climate Change; and in annex II, article 3 (3) (c), of the Convention for the Protection of the Marine Environment of the North-East Atlantic. The 1996 Protocol to the London Dumping Convention states, in article 3.1: "In implementing this protocol, Contracting Parties shall apply a precautionary approach to environmental protection ... when there is reason to believe that wastes or other matter introduced in the marine environment are likely to cause harm even when there is no conclusive evidence to prove a causal relation between inputs and their effects". In its second preambular paragraph, the evolution within the London Convention towards approaches based on precaution and prevention is noted. The precautionary principle is one of the bases for community policy on the environment of the European Union.

Several codes which include the precautionary approach have been developed, inter alia, the 1994 Code of Practice on the Introduction and Transfer of Marine Organisms, by the International Council for the Exploration of the Seas; Guidelines for Preventing the Introduction of Unwanted Aquatic Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges, by IMO; and FAO's Guidelines on the Precautionary Approach to Capture Fisheries and Species Introduction.

The precautionary principle has been invoked before the International Court of Justice. Judge Weeramantry in his opinion dissenting from the Order of the Court of 22 September 1995 concluded that the precautionary principle was gaining increasing support as part of the international law of the environment.

National implementation and examples

The precautionary approach is widely accepted as a fundamental concept of national environmental laws and regulations in order to protect the environment. It is elaborated, for instance, in the Water Law and Planning Law of Israel, in the Environmental Protection Act of the Czech Republic, and is included in numerous draft environmental laws currently under consideration - for example in the Pakistan draft environmental protection act of 1996. The precautionary approach is also increasingly applied in court decisions - for example, in a decision of the Land and Environment Court of New South Wales, Australia, in which the Court stated that although there had been express references to what is called the "precautionary principle" since the 1970s, international endorsement had occurred only in recent years. Indeed, the principle had been referred to in almost every recent international environmental agreement. As a result, the Court upheld the appeal by the applicant and refused a license. A number of cases have been built on and approved this decision since.

In 1994, the Supreme Court of Pakistan quoted principle 15, holding that it seemed reasonable to take preventive measures straight away instead of maintaining the status quo because there was no conclusive finding on the effect of electromagnetic fields on human life.

ANNEX IV : EU Moratorium, historical background

By 1998, there was growing public opposition to GM crops and food across Europe. There was also increasing debate around the science of genetic modification. A number of Member States were expressing concern at the levels of uncertainty and had utilised a clause in the Deliberate Release Directive allowing a Member States to ban a GMO from its territory if it has new or additional evidence of harm to the environment or human health. This unease came to a head at the meeting of the EU Council of Environment Ministers in June 1999. France, Denmark, Greece, Italy and Luxembourg stated they would effectively block any new authorizations until the Deliberate Release Directive (90/220/EEC) was revised and that there was legislation in place to cover the labeling and traceability of GMOs. France, Austria, Belgium, Finland, Germany, Netherlands, Spain and Sweden felt this de-facto moratorium would be illegal. However, they stated that they would take a 'thoroughly precautionary approach in dealing with new authorizations and not to authorize the placing on the market of any GMO until it is demonstrated that there is no adverse effect on the environment and human health'. The EU Member States that created what became known as the *de-facto* moratorium called for a number issues to be addressed:

1. clarity of the rules surrounding the licensing of GMOs and GMO products;
2. due to the inability to give an absolute assurance of safety, a facility to immediately remove any product from the market place - via the implementation of traceability systems - should a health or environmental hazard arise.
3. a comprehensive labeling system to provide the consumer with the ability to choose to eat a GM product or not and demonstrate that traceability was in place.

In October 2002, the revised EU Deliberate Release Directive (200118/EC) came into force. In September 2003, two new EU Regulations concerning the authorization, traceability and labeling of GMOs and GMO derived products became law. However it will take until Spring 2004 for the new authorization regulations to be implemented and longer for the traceability and labeling regulations due to a need for another EU Directive to deal with mechanisms of identifying and labeling each individual GM line.

Since the revision of the Deliberate Release Directive, applications to market GMOs have been resubmitted and are currently being assessed. No applicant is known to have complained in anyway about applications being unduly held up.

ANNEX V : Change in EU regulation on GMOs

A. Current EU legislation in the EU on GMOs

Community legislation on GMOs has been in place since the early 1990s and throughout the decade, this regulatory framework has been further extended and refined. The EU introduced specific legislation designed to protect its citizens' health and the environment while simultaneously creating a unified market for biotechnology.

1. GMOs for deliberate release in the environment

Directive 2001/18/EC sets out the rules governing the release of GMOs into the environment. It entered into force in October 2002. It puts in place a step-by-step approval process, based on a case by case assessment of the risks to human health and the environment before any GMO or product consisting of or containing GMOs, such as maize, tomatoes, or micro-organisms can be released into the environment or placed on the market.

This Directive only provides a general framework for the regulation of GMOs and does not address key environmental problems, like the genetic pollution of seeds and liability for environmental problems caused by GMOs. These problems have to be addressed in a separate piece of legislation ("Seed Purity Directive" (COM Proposal:SANCO/1542/02); Commission Recommendation on Coexistence; "Environmental Liability Directive" (COM Proposal:CM (2002) 21)). Moreover this Directive does not provide a legal basis for the labeling of GM Food and Feed (cf. below new Regulations).

Under Directive 2001/18/EC, a company intending to market a GMO must first submit an application to the competent national authority of the Member State where the product is to be first placed on the market. The application must include a full environmental risk assessment. If the national authority gives a favorable opinion on the placing on the market of the GMO concerned, this Member State informs the other Member States via the Commission. If there are no objections, the competent authority that carried out the original evaluation grants the consent for the placing on the market of the product. The product may then be placed on the market throughout the European Union in conformity with any conditions required in that consent.

If objections are raised and maintained, a decision has to be taken at Community level. The Commission first asks for the opinion of its Scientific Committees, composed of independent scientists, highly qualified in the fields associated with medicine, nutrition, toxicology, biology, chemistry, or other similar disciplines. If the scientific opinion is favorable, the Commission then proposes a draft Decision to the Regulatory Committee composed of representatives of Member States for opinion. If the Regulatory Committee gives a favorable opinion, the Commission adopts the Decision.

If not, the draft Decision is submitted to the Council of Ministers for adoption by qualified majority or rejection. If the Council does not act within 3 months, the Commission can adopt the decision.

During the notification process, the public is also informed and has access to the publicly available data on the Internet: http://gmoinfo.jrc.it/

2. GM foods

Regulation (EC) 258/97 on Novel Foods and Novel Food Ingredients sets out rules for authorization and labeling of novel foods including food products containing, consisting or produced from GMOs.

The first step of an authorization procedure is an assessment of an application to market a GM food product by the Member State where the food is to be first placed on the market. In case of a favorable opinion, this Member State informs the other Member States via the Commission. If there are no objections against the application, this Member State can authorize the product for marketing in the entire EU.

If there are objections by other Member States, a decision at Community level is required. The Commission consults the Scientific Committees on matters relating to public health and adopts a decision after receiving a favorable opinion from the Regulatory Committee composed of Member State representatives.

As a derogation from the full authorization procedure, the Novel Foods Regulation provides for a simplified procedure for foods derived from GMOs but no longer containing GMOs, which are "substantially equivalent" to existing foods with respect to composition, nutritional value, metabolism, intended use and the level of undesirable substances. In such cases, the companies only have to notify the Commission when placing a product on the market together with either scientific justification that the product is substantially equivalent or an opinion to the same effect, delivered by the competent authorities of a Member State.

3. GM seeds

EU legislation on seeds, notably Directive 98/95/EC, specifies that national authorities that have agreed to the use of a seed on their territory must notify this acceptance to the Commission. The Commission examines the information supplied by the Member State concerned and its compliance with the provisions of EU seeds legislation.

If such is the case, the Commission includes the variety concerned in the "Common Catalogue of varieties of Agricultural Plant Species" which means the seed can be marketed throughout the EU. The seed legislation furthermore requires that GMO seed varieties have to be authorized in accordance with Directive 2001/18/EEC before they are included in the Common Catalogue and marketed in the EU. If the seed is intended for use in food, it also has to be authorized in accordance with the GM Food and Feed Regulation

Genetically modified seed varieties must be labeled, in accordance with Council Directive 98/95/EEC. The label has to show clearly that it is a GM variety. Legislation on the marketing of forestry reproductive material also requires prior authorization of GM material in line with the requirements of Directive 2001/18. EU rules governing the marketing of vine material in line with Directive 2001/18 have also been adopted.

Further rules on growing conditions and other requirements for purity concerning the presence of GM seeds in seed lots of traditional varieties, have been proposed (DocSANCO/1542/02-January 2002; http://archive.greenpeace.org/geneng/highlights/gmo/draft_seed_directive.pdf).

B. EU Rules on traceability and labeling

The EU recognizes the consumers' right for information and labeling as a tool to make an informed choice. Since 1997 labeling to indicate the presence of GMOs as such or in a product is mandatory. From 17 October 2002 onwards Directive 2001/18/EC foresees that Member States shall take all necessary measures to ensure a labeling of GMOs as or in products at all stages of the placing on the market.

The Novel Foods Regulation provides for the mandatory labeling of foods and food ingredients which contain or consist of a GMO without prejudice to the other labeling requirements of Community law. The labeling requirements for foods produced from GMOs, but no longer containing GMO are based on the concept of equivalence.

Council Regulation (EC) 1139/98 lays down provisions for the labeling of foods and food ingredients derived from one maize and one soy variety based on the presence of DNA or protein resulting from genetic modification. This criterion serves as a model providing the rules applicable to labeling of all foods and food ingredients derived from GMO.

In January 2000, the Commission adopted Regulation (EC) 50/2000 ensuring that also additives and flavorings have to be labeled if DNA or protein of GMO origin is present in the final product.

Two new Regulations on GM Food and Feed (Regulation (EC) N1829/2003) and Traceability/Labeling (Regulation (EC) N1830/2003) entered into force in EU. The GM Food/Feed Regulation has replaced the authorization procedures for GMOs used in animal feed which were, until now unregulated by EU legislation. The Novel Food Regulation remains in effect for the placing on the market of 'novel foods' other than those produced from GMOs.

ANNEX VI : Genetically Modified (GM) Foods authorized in the European Union

	EVENT	CROP	APPLICANT	TRAIT	POTENTIAL FOOD USES	DATE	LEGAL BASIS
1	GTS 40/3/2	Soybean	Monsanto	Insect and herbicide tolerance	Soy foods. Soy beverages, tofu, soy oil, soy flour, lecithin.	03.04.1996	Dir. 90/220/EEC – Art. 13
2	Bt 176	Maize	Ciba-Geigy	Insect protection and herbicide tolerance	Maize foods. Maize foods include kernels, oil, maize flour, sugar, syrup.	23.01.1997	Dir. 90/220/EEC – Art. 13
3	TOPAS 19/2	Oilseed rape	AgrEvo	Herbicide tolerance		24.06.1997	Reg. (EC) 258/97 – Art. 5
4	MS1 / RF2	Oilseed rape	Plant Genetic Systems	Herbicide tolerance	Rapeseed oil. Products made with rapeseed oil may	24.06.1997	Reg. (EC) 258/97 – Art. 5
5	MS1 / RF1	Oilseed rape	Plant Genetic Systems	Herbicide tolerance	include fried foods, baked products and snack foods.	24.06.1997	Reg. (EC) 258/97 – Art. 5
6	GT 73	Oilseed rape	Monsanto	Herbicide tolerance		21.11.1997	Reg. (EC) 258/97 – Art. 5
7	MON 810	Maize	Monsanto	Insect protection		06.02.1998	Reg. (EC) 258/97 – Art. 5
8	T 25	Maize	AgrEvo	Herbicide tolerance	Maize derivatives. These may include maize oil, maize flour, sugar and syrup. Products made with maize	06.02.1998	Reg. (EC) 258/97 – Art. 5
9	Bt 11	Maize	Novartis	Insect protection	derivatives may include snack foods, baked foods, fried foods, confectionary and soft drinks.	06.02.1998	Reg. (EC) 258/97 – Art. 5
10	MON 809	Maize	Pioneer	Insect protection		23.10.1998	Reg. (EC) 258/97 – Art. 5
11	Falcon GS 40/90	Oilseed rape	Hoechst / AgrEvo	Herbicide tolerance		08.11.1999	Reg. (EC) 258/97 – Art. 5
12	Liberator L62	Oilseed rape	Hoechst / AgrEvo	Herbicide tolerance	Rapeseed oil. Products made with rapeseed oil may include fried foods, baked foods and snack foods.	08.11.1999	Reg. (EC) 258/97 – Art. 5
13	MS8/RF3	Oilseed rape	Plant Genetic Systems	Herbicide tolerance		26.04.2000	Reg. (EC) 258/97 – Art. 5
14	1445	Cotton	Monsanto	Herbicide tolerance	Cottonseed oil. Products made with cottonseed oil may	19.12.2002	Reg. (EC) 258/97 – Art. 5
15	531	Cotton	Monsanto	Insect protection	include fried foods, baked foods and snack foods.	19.12.2002	Reg. (EC) 258/97 – Art. 5
16	pRF69/ pRF93	Bacillus subtilis	F. Hoffmann - La Roche	Riboflavin	Vitamin B2	23.03.2000	Reg. (EC) 258/97 – Art. 5

Companies clarification: Ciba Geigy (now Syngenta); AgrEvo=Aventis CropScience, today Bayer Cropscience; Plant Genetic Systems became part of Aventis CropScience, today Bayer Cropscience; Novartis (agricultural sector today Syngenta); Pioneer=since 1998 owned by DuPont, DuPont markets GM crops through Pioneer.

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Overview of Citizens and Legal Actions

A/ Citizens Actions

Global Actions

Greenpeace and **Friends of the Earth** run international campaigns against GMOs.

Global Citizen's GMO Challenge is an internatioal call against GMOs and collects signature of individuals and institutions.

The International Federation of Organic Agriculture Movement promotes worldwide organic farming.

South Africa

— 2004: the South African Freeze Alliance on Genetic Engineeering and other citizens groups demand a moratoriumon the growing, the import and export of GMOs.

Burkina Faso

— April 2004: a workshop on „GMOs and the Rights of Local Communities" took place in Ouagadougou, organized by the National Federation of Peasant Organizations.

Sudan & Angola

— March 2004: introduced restrictions on GM food aid.

Zambia

— October 2002/2003: overcomes its food crisis without GM food aid.

China

— Consumers support labelling of GM products and many would buy non-GM products if they had a choice.

Japan

— 2003: the NO-to-GMO-Rice-Movement, against GM rice trials and imported GM crops and food is growing.

— January 2004: at its annual meeting, the Soy Trust protests against GMO soya field trials and imports. In the last years, the Trust successfully increased local non-GM soya production.

Thailand

— Does not grow GM crops commercially but pressure to do so.

— January 2004: Thailand's Agricultural Ministry still resists US pressure to allow commerial growing of GM crops.

Philippines

— June 2003: RESIST, largest anti-GM alliance, launches a national boycott campaign against Monsanto.

Indonesia

— March 15, 2001: 40 tons of Monsanto's Bt cotton were flown into South Sulawesi. Activists protested the government for no respect of quarantine process.

India

1998 – 2004:

— The National Alliance of Women for Food Rights, a network of all women's organizations started a campaign to stop the dumping of GM Food (corn) in the name of relief and aid. The government responded by banning such imports.

— The government had to reject to import 10,000 million tons of corn Soya blend suspected of containing Bt Starlink corn as food aid (by CARE India and Catholic Relief Service).

— April 25, 2003: GEA denied commercial clearance to Monsanto's cotton for the Northern Indian states.

— 2003: *Bija Satyagraha (*Seed Satyagraha) had a major victory when it could stop Syngenta from bringing into its possession Dr. Richaria's collection of 22,972 varieties of India's rice paddy.

New Zealand

— October 2003: 9000 people marched to the capital for the GMO moratorium to be preserved.

— 2004:*GE-free-New-Zealand* campaigners repeatedly demonstrate against the contamination of Ingham's chicken with GE feed.

Australia

— March 2004: several state governments have declared to ban GMOs or announced to continue their already existing moratorium: the Northern Territory, Western Australia and Victoria.

USA

— Communities throughout the US have enacted regulations at the state and local levels: 79 Vermont towns, 11 in Massachusetts, 1 in New Hampshire have past resolutions, most calling for both labeling of GM foods and a moratorium on GE crops. Mendocino County in northern California has voted on a complete ban of GMOs. Main refused the use of Bt corn in the state.

EU

— From 1998 until May 19th 2004: de facto moratorium

— May 2004: *The Save our Seeds movement*, composed of hundreds of farmer and ecologist groups, trade unions and cooperatives handed a 200,000 signature petition to the European Union Environment Commissioner while the commission was preparing for their directives on seeds.

— 2004: GE-free zones: Austria, Belgium, France, Greece, Italy, Slovenia and the UK have created GM-free zones.

— 1989: launched of the international Slow Food movement that aims at preserving traditional food as opposed to GM food.

Belgium and France

— Expert committees refuse Syngenta Bt 11 corn and request full toxicological studies.

Spain

— January 2004: Spain banned planting of Syngenta corn Bt176 by Syngenta because it can possibly generate resistance to antibiotics.

UK

— 1999: Five Year Freeze on GE and patenting in food and farming is launched. In 2004 the Freeze movement calls on renewal of moratorium.

— February 1999: UK Five Year Freeze campain launched for people's right to choose GM-free food.

— 2000-2002: Friends of the Earth forces national „seed list"-hearings.

— 2004: Victory for Friends of the Earth and other campaigners: Bayer CropScience withdraws Chardon LL maize.

Germany

— 2004: Opponents destroy Syngenta wheat trial field. Organic farmers put over 25 000 boards in the field that read:"We work without genetic engineering."

Switzerland

— 2003: the Swiss Farmer's Union, Pro Natura and Greenpeace, launched a people's initiative for a GM moratorium, collected 120,000 signatures and in September submitted it to the government.

Argentina

— Ongoing: The Grupo de Reflexion Rural is trying to fight the "supremacy" of the Monsanto and demands from the government to oblige its own people instead of the biotech industry and the US.

Brazil

— March 2004: To avoid contamination, Greenpeace prevented a cargo ship carrying GM Argentine soybeans from entering Paranagua, Brazil's main grain port, in the state of Parana. (In October 2003 Parana had banned GMO soybeans.)

— June 2003: members of the landless workers movement in Brazil (MST) invaded a farm owned by Monsanto in the central state of Goias.

— March 11, 2004: The International People's Court on Transgenic Products was organized by approximately 40 groups such as trade unions, NGOs, and environmental institutions (see also Legal Actions).

Mexico

— Since 1998: Mexico imposed a ban on planting GE corn.

— The Zapatista Education System created *„Mother Seed in Resistance from the Lands of Chiapas"* to preserve and collect maize. They are also researching and recording agricultural information associated with their corn.

— For Summer 2004: the movement plans to carry out over 1000 tests on corn seed from various communities in Chiapas to see whether any GMO contamination has taken place and to create „corn sancturies" to preserve the precious Maya corn heritage.

B/ Legal Actions

Philippines

— 2001: Monsanto and Pioneer were sued for illegal field tests of Bt corn in 1999/ 2001.

Indonesia

— 2002: a coalition of environmental NGO has urged the Supreme Court to rule against the government's policy allowing GMOs to be planted in Indonesian soil.

India

— 2002: Supreme Court challenge brought by the RFTSE against Monsanto/Mahyco because of illegal (unauthorized) Bt cotton field trials.

— January 7th, 2004: *Gene Campaign* filed a public interest litigation (PIL) in the Supreme Court.

Brazil

— 1998: Greenpeace and the Institute for Consumer Protection (IDEC) went to court to challenge the legal authority of the National Biosafety Committee (CNTBio), which had granted approval to Monsanto's RoundupReady soybeans.The Court decided in favour of Greenpeace and IDEC.

— 2003: Attorney General Claudio Fontelles filed a request asking the Supreme Court to overrule the decree. The National Farm Workers Confederation, followed by the Green Party, filed a similar suit using the same argument.

Canada

— The Saskatchewan Organic Directorate (SOD), through its Organic Agriculture Protection Fund, has launched a class lawsuit against Monsanto and Bayer on behalf of over 1,000 of the province's organic canola farmers.

— The Canadian farmer Percy Schmeiser was trailed for having planted GM canola containing genes of the US company Monsanto, of which he had not acquired the proprietary licensing agreement. The Supreme Court has exonerated him on May 22. He is not forced to pay Monsanto anything as he did not profit from the presence of RR canola in his fields but the Court determines Monsanto's patent is valid.

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